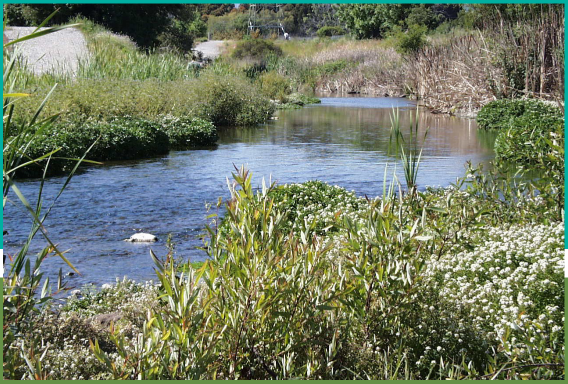
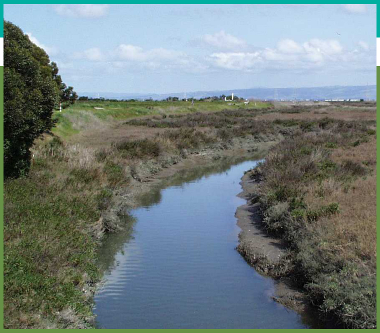
Flooding in San José

Study Session on
Flood Management Issues
November 19, 2007

Flooding in San José

Floodplain Management





Floodwater Management

Emergency Preparedness

A joint meeting of the Santa Clara Valley Water District Board of Directors and the San José City Council.

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Santa Clara Valley Water District

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Flooding in San José

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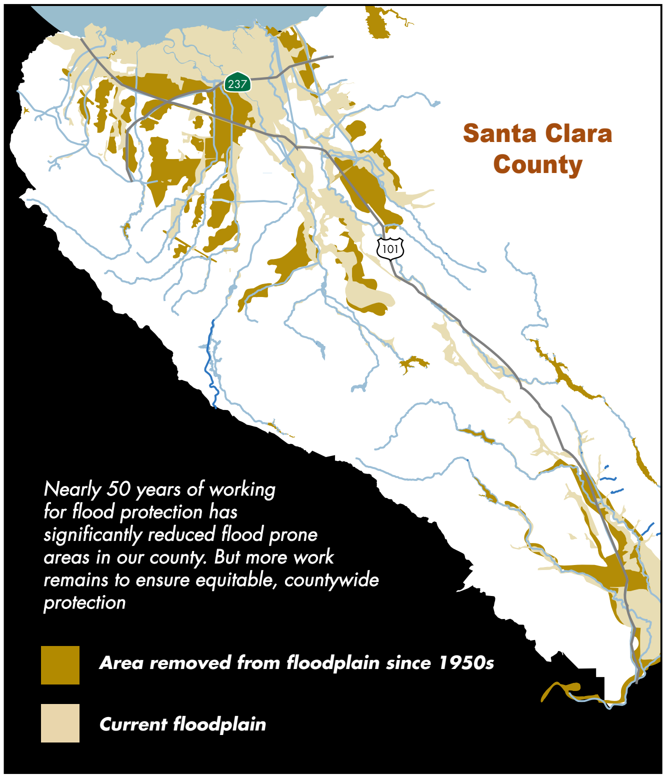
A1 Historic flooding – a challenge for the future

Flooding in San José

Flooding is a natural event. When this area was the Valley of Heart's Delight and the predominant land use was agricultural, flooding helped to sustain the richness of the land. Historically, much of the area that is now incorporated as cities was subject to flooding. As the area converted from agriculture to urban, growth was predominantly located in the flat, low lying areas of the county. These land use decisions placed development in flood hazard areas and thereby increased the risk of personal and community loss due to flooding.

As the pressures to maximize the amount of developable lands in flood prone areas grew, major public investments were made to build and maintain systems to catch and remove flood waters from urbanizing areas. Essentially the low lying areas of the valley were "re-plumbed" to divert the natural flow of flood waters into constructed systems. The City of San José built storm drain and pump systems to catch storm water runoff. These waters flow into stream channels and the Santa Clara Valley Water District built flood protection structures including levees within these channels to provide the community with flood protection.



Nearly 50 years of working for flood protection has significantly reduced flood prone areas in our county. But more work remains to ensure equitable, countywide protection

■ ***Area removed from floodplain since 1950s***

□ ***Current floodplain***

Existing flood safety, a large investment

Comparisons of the areas subject to flooding in the 1950s versus today reveal that there has been a significant reduction in the amount of flood prone areas due to public investment into flood protection systems. The estimated book value for flood protection systems is $402,497,818 (values based on Asset Register dated 10/04/07). As a result of this level of investment, areas such as North First Street have experienced significant private investment and have helped fuel the transformation of the county into a premier part of the world economy. The existing flood protection systems need continued maintenance and in some cases reinvestment to sustain the planned level of flood protection. Aging systems will need replacement as the life expectancy of those systems is reached. Continued urbanization can also boost the amount of runoff, beyond planned flows. As a result, even well maintained systems can be overwhelmed and areas can flood.

Examples of the level of continued public investment into these systems include:

- City of San José annually expends $6.8 million to maintain its storm drain system
- Santa Clara Valley Water District annually expends on average about $2.4 million county wide for stream bank stabilization
- Santa Clara Valley Water District annually expends on average about $8.4 million county wide to maintain channel capacity

For the most part, maintenance of existing public flood protection systems is funded

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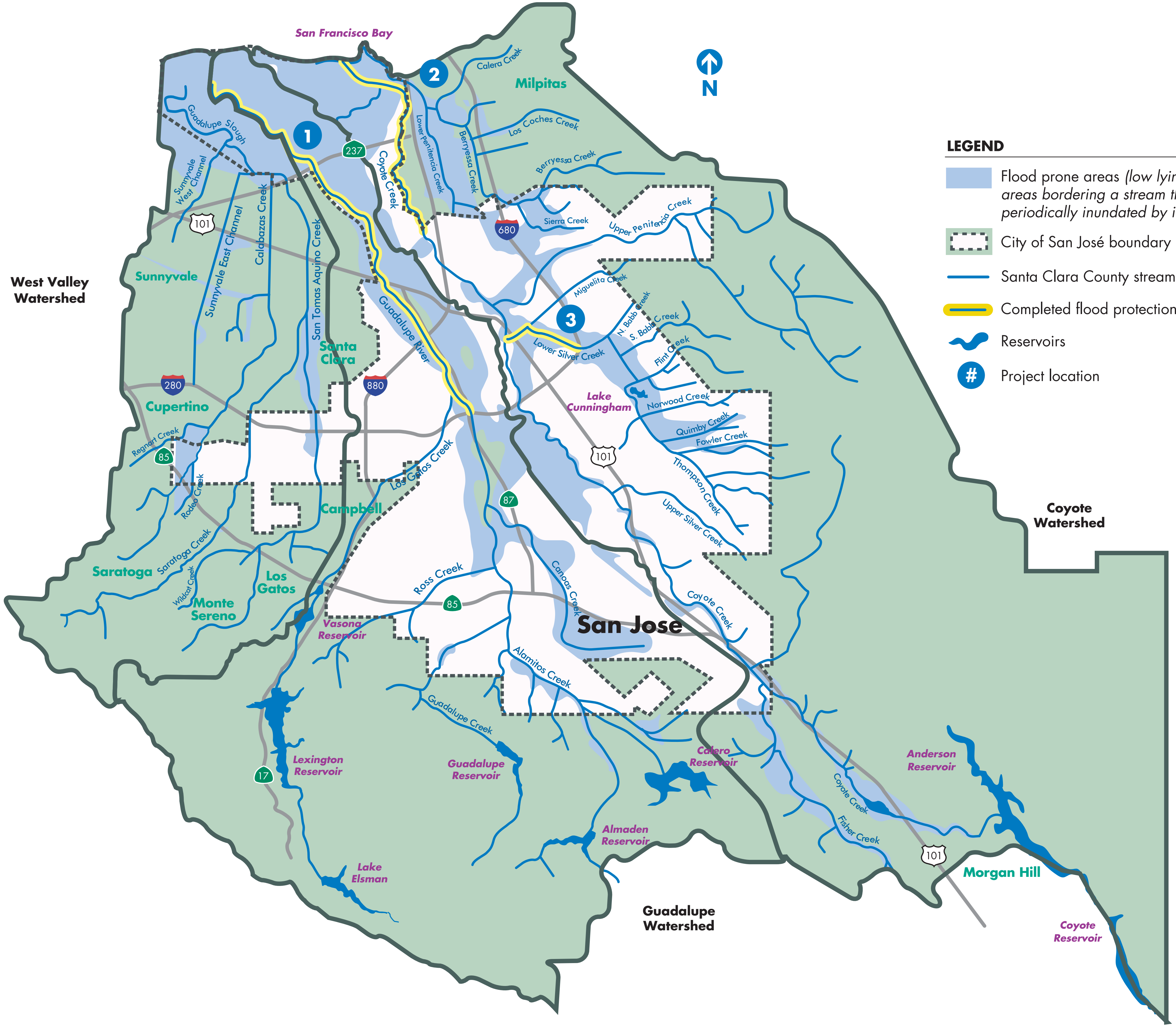
through local property taxes, requiring a two-thirds vote of the public to increase such taxes. In 2000, the water district was successful in gaining voter approval of a 15 year measure to increase funding for the construction of identified new flood protection systems, the maintenance of channels and other related benefits. Both the City and the water district have a financial challenge to sustain existing levels of flood protection in built areas due to increasing costs for on-going maintenance and costs for replacement of aged infrastructure.

Despite a large public investment in flood protection systems, there are areas that remain subject to flooding. Until flood protection systems can be built in those areas, development will need to employ special flood safe standards. Insurance is also required for federally insured mortgages to help with recovery in the event of a flood and emergency response systems will need to be ready.

Future flood safety

In addition to the maintenance or replacement of existing flood protection systems, construction of new systems is proposed. Fact sheet C4 provides an overview of the planned new systems. The water district leverages state and federal funds to augment local dollars to build these systems. Today, of the nine planned projects, only three are fully funded. The known projected funding gap to complete capital projects in San Jose is approximately $332 million. A plan to leverage local, state and federal support for new and existing flood protection systems is essential.

A2 Completed flood protection projects



LEGEND

- 🟦 Flood prone areas *(low lying areas bordering a stream that are periodically inundated by its waters)*
- ⬚ City of San José boundary
- — Santa Clara County streams
- ━ Completed flood protection projects
- ~ Reservoirs
- # Project location

Capital Improvement Program Projects

Guadalupe Watershed

① Lower Guadalupe River/ Downtown Guadalupe River
- *From Alviso to I-880*
- *Over 3,400 parcels protected*

Coyote Watershed

② Lower Coyote Creek
- *From San Francisco Bay Montague Expressway*
- *Completed in 1995 in partnership with U.S. Army Corps*
- *Over 1,300 parcels protected*

③ Lower Silver Creek
- *From Coyote Creek to I-680*
- *Completed in 2005 in partnership with NRCS*
- *Over 300 parcels protected*

Note: The flood prone areas shown on the map do not reflect changes resulting from recently completed flood protection projects. FEMA will be producing electronic copies of the flood prone areas in the future.

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A3 Glossary of flood protection terms

There are many unique words associated with flooding, flood protection and the features of a stream. The following are several commonly used words.

Word	**Definition**
Acre foot	A volume of water that would cover one acre to a depth of one foot (approximately 325,000 gallons).
Bank protection	Vegetation or inert materials placed on streambanks to repair eroded areas as well as to prevent anticipated erosion.
Bypass channel	A flood protection facility through which a portion of a stream's flow is diverted from the main channel, conveyed along a separate channel, and reintroduced at a downstream point. Bypass channels can be used during construction or maintenance projects. Permanent bypass channels can also be designed to accommodate flood flows.
CFS or cubic feet per second	A rate of flow that would fill a one-cubic foot container (about 7-1/2 gallons) in one second.
Confluence	A meeting of two or more streams or rivers.
Culvert	Any covered structure not classified as a bridge which conveys a waterway.
Degradation	Process of lowering a streambed through erosion, scour, or down-cutting.
Design capacity	An engineering term used to describe the rate of flow that a modified channel is designed to convey.
Design flow	The magnitude of stream flow that is used in design of channel improvements and structures across the channels.
Drainage area	Land area that collects runoff and drains into a stream or a reservoir.
D/S	Abbreviation for "downstream".
Erosion	The detachment and movement of soil or rock fragments by water, wind, the force of gravity or extreme heat.
FEMA	Federal Emergency Management Agency. This agency has authority over the National Flood Insurance Program and publishes the Flood Insurance Rate Maps.
Fish ladders	Stepped pools to enable fish traveling upstream, against the flow of water, to span a large vertical distance in a series of gradual steps. Used at dams or other in-stream barriers.
Flood	The temporary inundation of lands normally dry; any waters escaping from a creek or river or when the capacity of storm drains is exceeded.
Flood capacity	The capacity of a channel to carry calculated flood flows. Capacity is dependent on cross-sectional area and frictional components (e.g., type of channel bottom, channel vegetation).
Flood Hazard Boundary Map (FHBM)	The official map of a community that shows the boundaries of the floodplain and special flood hazard areas that have been designated. It is prepared by FEMA using the best flood data available at the time a community enters the emergency phase of the National Flood Insurance Program. It is superseded by the FIRM after a more detailed study has been completed.
Flood Insurance Rate Map (FIRM)	The official map of a community prepared by FEMA that shows the Base Flood Elevations, along with the special flood hazard areas and the risk premium zones for flood insurance purposes. Once it has been accepted, the community is part of the regular phase of the NFIP.
Flood prone areas	Any area subject to flooding.
Flood Risk Map	See definition of Flood Insurance Rate Map (FIRM)
Floodplain	Low lying areas bordering a stream that are inundated periodically by its waters.
Floodwall	A wall constructed at the top of a channel bank to prevent flooding of the surrounding land.

A3 Glossary of flood protection terms

Word	Definition
Floodway	The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to pass the 100-year flood without cumulatively increasing the water surface elevation more than one foot.
Freeboard	Vertical distance between the design water surface elevation and the top of the bank, levee, or floodwall that contains the water.
Geomorphology	The study of the natural relationship between a stream and its bank and bed. Forced into an unnatural position, the streambed and bank will erode. Shaped to match the water flow, the stream remains more stable.
Hard structures	Bank protection or other structures incorporating rock, sacked concrete, gabion baskets or concrete. These structures are inert and rigid.
Hydrology	The branch of physical geography concerned with the behavior of water in the atmosphere, on the surface of the earth and underground.
Hydraulics	Engineering application of physics dealing with mechanical properties of liquids in motion.
In-channel structures	Structures located within the bed and banks of the channel. Structures in the bed include, typically to stabilize incision of the bed, weirs, steps, pools, riffles and pools; structures on the bank, typically for bank protection, include rock, vegetated rock, brush mats, terraces, crib walls, etc.
Levee	An embankment higher in elevation than adjacent ground constructed to prevent a river or stream from flooding adjacent lands.
Low flow channel	That section of stream which carries the most frequent, periodic streamflows.
Mean sea level (MSL)	An elevation midway between mean high and mean low tides in an open sea.
Natural channel	A watercourse without any significant modifications and little evidence of historical alterations.
Reach	A length of a stream usually having similar physical and biological characteristics or a discrete portion of a stream under design or study.
Restoration	The reestablishment of the structure and function of ecosystems. Ecological restoration is the process of returning an ecosystem as closely as possible to pre-disturbance conditions and functions.
Riprap	A layer of rock of varying size, typically brought to a site and used to protect stream banks from scour.
Riverine flooding	Flooding that occurs along a channel or stream that is caused when a channel receives more runoff than it can convey within its banks.
Runoff (surface)	The portion of precipitation that moves across the land surface and in stream channels that does not infiltrate into the ground. Runoff occurs only after the storage capacity of the landscape has been exceeded.
Scour	Erosive action of flowing water that removes material (e.g., soil, rocks) from a stream bed or bank.
Sediment	Solid material, both mineral and organic, that is transported and or deposited in streams and waterbodies.
Sediment removal	The act of removing sediment deposited within a stream. Typically, sediment is removed when it reduces capacity.
Sheetflooding	Shallow uniform depth (less than a foot deep) flooding that spreads out over a large area.
Streambed	The stream bottom bounded by stream banks. It is the area kept mostly bare of vegetation by the wash of water in the stream.
U/S	Abbreviation for "upstream".
Vegetation Management	Removal or tending of vegetation in and adjacent to streams.
Velocity	Distance water travels in a stream during an interval of time. Flow velocity depends on the slope, roughness and uniformity of channel bed and banks, flow, and size of channel.
Watershed	A geographic area that drains into a stream and its tributaries to a common outlet, river, lake or bay. A ridge or drainage divide separates a watershed from adjacent watersheds.
Widen-one side of channel	Modify channel cross-section whereby one of the slope walls is modified to include a terrace allowing the bank to widen on that side by incorporating a bankfull bench, a point bar, a terrace, sloping back the bank, opening up the bankfull and flood channel.
1% flood	Refers to a flood of a magnitude that has an estimated probability of 1 percent occurrence in any given year. Technically, this is a more precise way of referring to the "100-year flood". The National Flood Insurance Program refers to this flood as the base flood.
100-year flood	An often-used term synonymous with the 1% flood; this term can be misinterpreted to mean that a 1% flood only occurs once every 100 years.

A4 Overview of funding sources and constraints

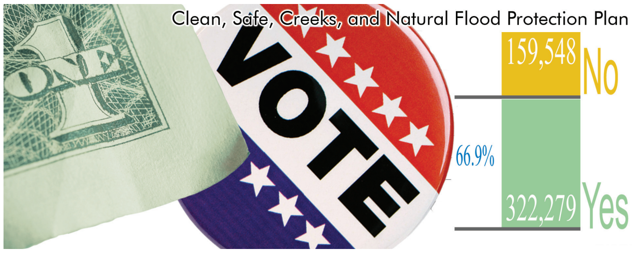
Flooding in San José

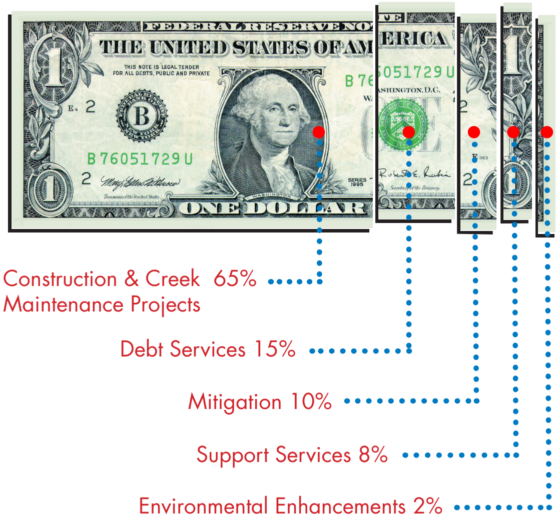
As the county's population and economy have grown, the water district has worked hard to keep pace with the construction, operation and maintenance of flood protection and stream stewardship projects. This continuous and expensive process has relied on partnerships with state and federal agencies and local funding from ad valorem property taxes, benefit assessments and a special parcel tax. The average homeowner in San Jose pays approximately $102 a year for these services.

Voters demonstrate a continued commitment to flood protection and stream stewardship

Many valley residents will never forget the catastrophic flooding which ravaged parts of Santa Clara County during the 1980s and 1990s. The severity of the damage encouraged voters to pass ballot measures in 1986, 1990 and 2000 creating a seamless flow of funding.

Today's Clean, Safe Creeks and Natural Flood Protection Plan serves every county resident, even those who do not live near a creek or river, by working to keep our roads and highways, schools and transportation networks safe from flooding. In addition, as prescribed by the voters, all projects strive to maintain or enhance the natural qualities, scenic beauty and recreational opportunities of our local waterways.





Ability to protect taxpayer investment is precarious

While the water district has made great strides in removing or reducing the flood threat from many valley creeks, there are still portions of south bay watersheds that will flood during heavy storm years. As more urban development blankets the valley floor, more flood protection projects are needed to handle the increased runoff.

However, the major source of funding for these programs – the voter-approved special parcel tax – expires in 2016. The resulting revenue shortfall will significantly impact the water district's ability to provide flood protection and stream stewardship services to the community.

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A4 Overview of funding sources and constraints

Continued funding can allow planning and construction of crucial new flood protection projects countywide, as well as maintain the frequency and scope of creek repairs and maintenance. This will ensure that areas now protected remain protected in the future. Continued funding can also continue critical environmental work such as stream habitat restoration and pollution prevention in San Francisco and Monterey bays.

Without funding, no new projects will be undertaken and creek maintenance will be reduced so dramatically that some areas previously protected once again may be subject to flooding. Further, residents are likely to turn to their city government with the expectation that municipalities will assume responsibility for those programs currently administered by the water district.

How proposition 218 significantly changed local government finance

(source: California Legislative Analyst)

"The people of the State of California hereby find and declare that Proposition 13 was intended to provide effective tax relief and to require voter approval of tax increases. However, local governments have subjected taxpayers to excessive tax, assessment, fee and charge increases that not only frustrate the purposes of voter approval for tax increases, but also threaten the economic security of all Californians and the California economy itself. This measure protects taxpayers by limiting the methods by which local governments exact revenue from taxpayers without their consent."

This constitutional initiative–approved by the state's voters in November 1996–applies to each of California's nearly 7,000 cities, counties, special districts, schools, community college districts, redevelopment agencies, and regional organizations. More than two decades ago when Proposition 13 sharply constrained local governments' ability to raise property taxes, the mainstay of local government finance. Proposition 13 also specified that any local tax imposed to pay for specific governmental programs–a "special tax"–must be approved by two-thirds of the voters.

Since that time, many local governments came to rely upon other revenue tools to finance local services, most notably: assessments, property-related fees, and a variety of small general purpose taxes (such as hotel, business license, and utility user taxes). The use of those local revenue tools was the focus of Proposition 218.

In general, the intent of Proposition 218 was to ensure that all taxes and most charges on property owners are subject to voter approval. In addition, Proposition 218 sought to curb some perceived abuses in the use of assessments and property-related fees, specifically the use of these revenue-raising tools to pay for general governmental services rather than property-related services.

Proposition 218 restricts local governments' ability to impose assessments and property-related fees–and requires elections to approve many local government revenue raising methods. Because of this, it is likely that over the long term local governments will raise fewer revenues from assessments, property-related fees, and some taxes.

While locally elected governing boards continue to be fully responsible for decision-making regarding the expenditure of public funds, they now have very little authority to raise funds without a vote of the residents or property owners.

A5 Climate change – potential flooding impacts

Flooding in San José

Introduction

In California and throughout western North America, signs of a changing climate are noticeable. During the past 50 years, winter and spring temperatures have been warmer, spring snow levels in lower- and mid-elevation mountains have dropped, the Sierra snowpack has been melting one to four weeks earlier and flowers are blooming one to two weeks earlier. Regional changes are consistent with global trends.

The latest projections, based on state-of-the art climate models, indicate that if global heat-trapping emissions proceed at a medium to high rate, temperatures in California are expected to rise 4.7 to 10.5°F by the end of the century. In contrast, a lower emissions rate would keep the projected warming to 3 to 5.6°F. These temperature increases would have widespread consequences including substantial loss of the Sierra snowpack, increased risk of large wildfires, and reductions in the quality and quantity of certain agricultural products. While there are many anticipated water related impacts related to climate change, flooding impacts in Santa Clara County are anticipated in the areas described below.

San Francisco Bay level rise

During the past century, sea levels along California's coast have risen about seven inches. If heat-trapping emissions continue unabated and temperatures rise into the higher warming range, sea level is expected to rise an additional 22 to 35 inches by the end of the century. Currently there is inadequate and non-engineered flood protection along the Bay front. Levees which do exist were built for salt production purposes and supply flood protection was a by-product. Increases in the elevation of the bay as projected most likely would overwhelm the abilities of the existing salt pond levees. As a result many communities in Santa Clara County and southern Alameda County, could be threatened by tidal flooding. There are homes and major businesses located within the possible tidal flooding area. Significant infrastructure including wastewater treatment plants, freeways and Moffet Field could all be affected.

The South Bay Salt Pond Restoration Project and the Corps of Engineers Shoreline project are taking the prospect of sea level rise into their planning consideration. Generalized levee locations have been identified. No funding to build such flood protection has been secured.

Flooding adjacent to streams

Information about climate change related to flooding along streams is very general and at a state-wide scale. Locally what is anticipated is that storms will be more sporadic, more intense, and less predictable. Therefore, the location of flood prone areas may change over time as rainfalls alter. Measures to increase the resiliency of stream related flood protection are suggested.

Adapted from "Our Changing Climate: Assessing the Risks to California," a summary report from the California Change Center.

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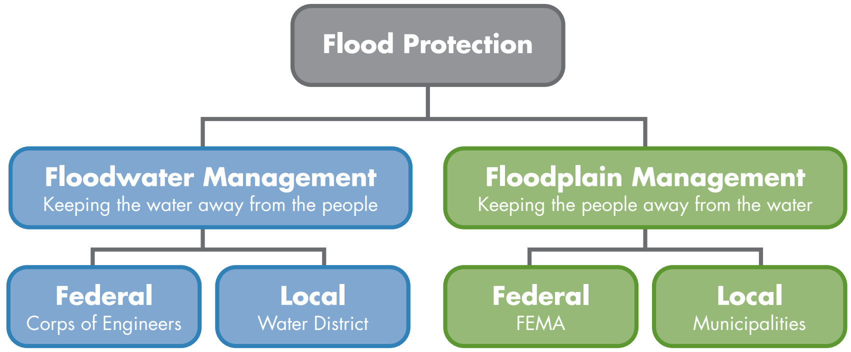
A6 Water District and City roles

Flood Protection = Floodwater Management + Floodplain Management



Good flood protection is a judicious combination of floodwater management and floodplain management. When appropriately combined, the two approaches will minimize losses while maximizing the benefits of living near a riparian system.

Floodwater management – keeping the water away from the people

- *The water district is primarily responsible for floodwater management in Santa Clara County*
- *The primary federal partner is the Corps of Engineers*

Floodwater management includes actions to modify the natural flow of floodwaters - either by confining high flows to the creek corridor or by detaining high flows in reservoirs or detention basins. Floodwater management typically involves capital work that modifies the natural landscape. Managing floodwaters helps to reduce the number of homes, schools and businesses subject to flooding by reducing the chances that water will overbank from creek channels onto developed areas. Significant partnerships can be forged with the U.S. Army Corps of Engineers or other federal agencies. These agencies provide expertise and can bring federal funding into the local area, often making a multi-objective flood protection, riparian restoration and recreation project a reality that the local agencies alone could not fund.

Partnerships with local agencies are also very important - the water district works with cities and state agencies to ensure that recreation or aesthetic opportunities are identified and developed.

Floodplain management - keeping the people away from the water

- *Floodplain management is primarily the responsibility of the cities and the county*
- *The primary federal partner is FEMA and NFIP*

Floodplain management relies on land use decisions and regulations that manage activities or development within the floodplain to accommodate floodwater without significant disruption to public health, safety or property. Local land use agencies are responsible for administering floodplain management. They work in partnership with FEMA which provides guidance and incentives toward wise floodplain management. FEMA's National Flood Insurance Program (NFIP) requires each land use agency to adopt and enforce a floodplain management ordinance.

In an effort to encourage communities to establish sound floodplain management programs that go beyond the NFIP minimum requirements and incorporate such activities as education, technical support, flood data management and flood warning programs, FEMA created the Community Rating System (CRS), which can qualify communities for reduced flood insurance rates. The water district has long supported local participation in the CRS program, and annually documents its own significant CRS-creditable activities, which can be credited to each local community to build on.

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A7 A shared commitment to safety

Both the Santa Clara Valley Water District and the City of San José have policies to provide flood protection and emergency response. The roles and responsibilities of the two agencies are different and therefore the policy focus will vary and address related and different aspects. A commitment to safety and a safe community is central to both agencies. Fact Sheet A6 discusses the respective roles of each agency.

CITY OF SAN JOSÉ FLOOD PROTECTION AND EMERGENCY PREPAREDNESS POLICIES

Policies related to the quantity and quality (erosion aspects)

The size of a storm or the amount of rain over a given period of time is an obvious factor influencing the potential of flooding. Of equal importance is the amount of rain that is absorbed into the ground versus the amount of water that becomes runoff. Runoff that is collected throughout a watershed that exceeds the capacity of a storm drain system or of a stream channel yields flooding to some degree. Runoff can also carry sediment and debris which can fill and clog storm drains and stream channels. Land use policies and practices need to be in harmony with the receiving systems to lessen flooding potentials. City policies related to the quantity and quality of runoff are:

- **Quality of Runoff (During Construction), Erosion and Sediment Control:** Primarily during the wet season (October 15th to April 15th of every year), but also throughout the year, construction projects of all sizes are required to perform erosion and sediment control operations to minimize the amount of construction related sediment from infiltrating the storm system. The Public Works Department in cooperation with the Environmental Services Enforcement group perform staff/developer/contractor training sessions, require Erosion and Sediment Control Plans, and perform field inspections to ensure that this program is successful.

- **Quality of Runoff (Post Construction) Policy 6-29, Post Construction Urban Runoff Management:** Enacted by the Council in 1998, this policy addresses the City's response to the City's Stormwater NPDES permit by requiring that all projects which create or replace 10,000 square feet or more of impervious surface area to incorporate stormwater treatment measures that are engineered based on the amount of impervious surface on the site.

- **Quantity of Runoff (Post Construction) Policy 8-14, Post-Construction Hydromodification Management:** Enacted by the Council in 2005, this Council Policy establishes a framework for incorporating measures into the City's development review and approval process to control hydromodification impacts from new and redevelopment projects where hydromodification is likely to cause increased erosion, silt pollution generation or other impacts to beneficial uses of local rivers, streams and creeks.

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A7 A shared commitment to safety

Policies related to flood protection design and emergency response

Flooding is a natural phenomenon. In urban areas there is a tension between maximizing developable land and providing room for streams to flood. San Jose's land use policies extend to approximately 53% of lands within streams. Locating buildings within areas that are projected to flood requires special building standards, flood insurance to help people recover from flood episodes and emergency plans to respond to those episodes. City policies related to siting of development and emergency response are:

- **Special Flood Hazard Zones, Municipal Code Section 17.08:** The City has section of Municipal Code dedicated to construction within Special Flood Hazard Zones. Originally adopted in 1982 and updated in 2006, Section 17.08 allows the City to regulate construction within its 100-year floodplain to FEMA minimum standards. Specifically, properties within these floodplains are required to elevate or floodproof to base flood elevations and in some cases provide flooding studies to determine if the proposed projects will exacerbate flooding in flood prone areas.

- **Emergency Response:** The City of San José has a range of critical resources for emergency response, including a dedicated Emergency Operations Center as well as an Emergency Operations Plan that was adopted by City Council on August 17, 2004. This Emergency Operations Plan is compliant with federal regulations prescribed by the National Incident Management System, and has been updated periodically since its adoption three years ago. One of the more recent revisions added the Santa Clara Valley Water District to the Emergency Operations Center call-out list, and added a seat in the Emergency Operations Center for a representative from the water district.

SANTA CLARA VALLEY WATER DISTRICT FLOOD PROTECTION POLICIES

The Santa Clara Valley Water District owns right of way along 47% of the major creeks in San Jose. Within those channels the water district owns and maintains flood protection facilities and structures and maintains the designed flood channel conveyance capacity. Runoff exceeding the designed capacities or clogging of the capacities during a storm may cause flooding. Therefore, the water district also advocates for flood safe actions. Water district policies related to its services are:

A healthy and safe environment for residents and visitors

- Reduced potential for flood damages
  - Preservation of flood conveyance capacity for existing channels or facilities
  - Reduced size of flood prone areas
  - Reduced flood damages in flood prone areas
  - Avoidance of new flood prone areas
- Assets protected, adequately maintained or exposed to unnecessary risk

A8 Major creeks in San José

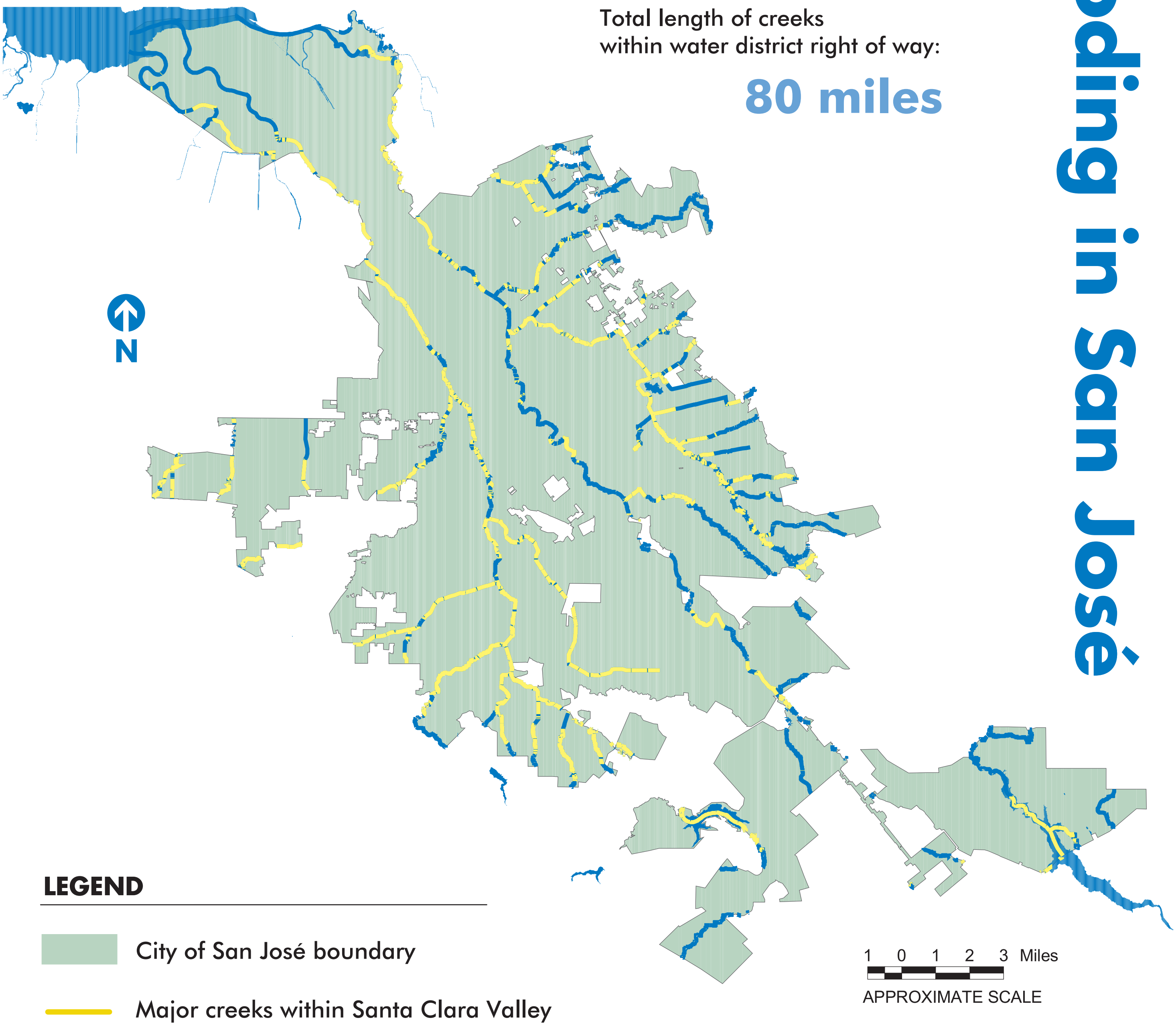
Flooding in San José

Total length of creeks
within San Jose:

170 miles

Total length of creeks
within water district right of way:

80 miles



LEGEND

🟩 City of San José boundary

🟨 Major creeks within Santa Clara Valley Water District right of way = 80 miles

🟦 Major creeks outside Santa Clara Valley Water District right of way = 90 miles

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Floodplain Management

B1 General Plan 2020 and Envision San Jose 2040

GENERAL PLAN POLICIES

San Jose 2020

- The General Plan represents the City's official policy regarding the future character and quality of development, and establishes goals and policies as the framework for decision-making on both private and public projects.
- The General Plan includes policies that are both directly and indirectly related to flooding.
- The City's planning and regulation of urban development directly affect flooding in San Jose.
- City policies and land use decisions directly affect the design of Santa Clara Valley Water District channel modifications.
- The City's General Plan Overall Flooding Goal is to protect the community from the risk of flood damage.

San Jose 2020 flooding policies

- New projects should be designed to minimize potential damage due to storm waters and flooding to the site and other properties.
- In designing improvements to creeks and rivers, adjacent properties should be protected from flooding.
- The "modified floodplain design" is the preferred design for future flood control facilities. The "widen-one-bank" and "trapezoidal channel" designs should only be used when funding or right of way limitations make the use of the modified floodplain design impractical.
- The City should continue to cooperate with other public and private jurisdictions and agencies to coordinate emergency response and relief efforts in case of flooding.
- New development should be designed to provide protection from potential impacts of flooding during the "1%" or "100-year" flood.
- Development in watershed areas should be allowed when adequate mitigation measures are incorporated into the project design to prevent unnecessary or excessive siltation of flood control ponds or reservoirs.
- Designated floodway areas should be preserved for non-urban uses.

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GENERAL PLAN

- The City and the Santa Clara Valley Water District should cooperate to develop flood control facilities to protect the Alviso and North San Jose areas from the occurrence of the "1%" or "100-year" flood.
- Appropriate emergency plans for the safe evacuation of occupants of areas subject to possible inundation from dam failure and natural flooding should be prepared and periodically updated.
- The City should support State and Federal legislation which provides funding for the construction of flood control improvements in urbanized areas.
- The City should require new urban development to provide adequate flood control retention facilities.
- The City should cooperate with the Santa Clara Valley Water District to develop additional flood control retention facilities in areas where existing retention facilities are nearing capacity.

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B1 General Plan 2020 and Envision San Jose 2040

GENERAL PLAN UPDATE

The current vision for the future growth and development of the City are captured in the San Jose 2020 General Plan, which was adopted by the City Council in 1994.

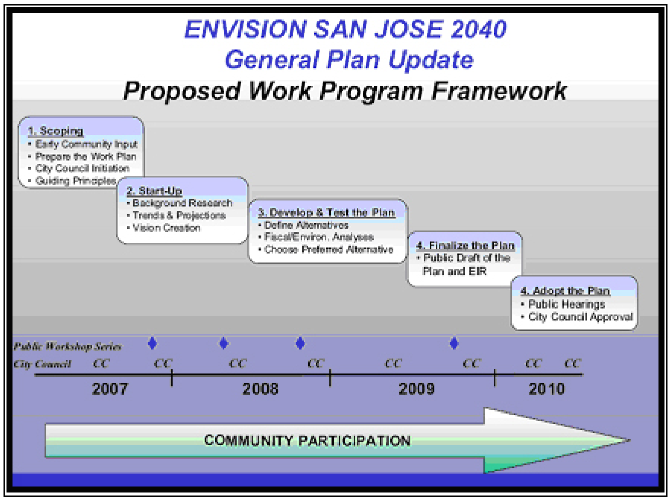
While the strategies in the Plan serve as a consistent and stable framework, San Jose's dynamic landscape continues to grow and evolve. It is once again time to consider the present and look ahead to the City's future by updating the General Plan. Titled, "Envision San Jose 2040", this will be the updated blueprint for the future growth of San Jose in the year 2040.

On June 26, 2007 the City Council approved the proposed Guiding Principles, Work Program and Community Participation Program for the Envision San Jose 2040 General Plan Update. The outcome of this study session on flooding will directly impact the development of the General Plan update and will provide the framework for San Jose's long-term growth.

Information regarding the Guiding Principles, Work Program, Community Participation, and Schedule for the Envision San Jose 2040 General Plan Update is available at the San Jose Planning Division's website at:

www.sanjoseca.gov/planning/gp_update/default.asp

ENVISIONSAN JOSE2040



ENVISION SAN JOSE 2040
General Plan Update
Proposed Work Program Framework

1. Scoping
- Early Community Input
- Prepare the Work Plan
- City Council Initiation
- Guiding Principles

2. Start-Up
- Background Research
- Trends & Projections
- Vision Creation

3. Develop & Test the Plan
- Define Alternatives
- Fiscal/Environ. Analyses
- Choose Preferred Alternative

4. Finalize the Plan
- Public Draft of the Plan and EIR

4. Adopt the Plan
- Public Hearings
- City Council Approval

B2 CEQA and flooding

As required by the California Environmental Quality Act (CEQA), passed by the California Legislature in 1970, the City conducts environmental review of public and private projects before they are heard for approval. The environmental documents produced by the City are provided to both decision makers and the public for their consideration and comment. These environmental documents include Environmental Impact Reports (EIRs) and Negative Declarations (NDs). The City's Environmental Clearance Ordinance, Title 21 of the Municipal Code, specifies exactly how environmental review is carried out in San Jose.

Clapper Rail

What is CEQA?

CEQA, or the California Environmental Quality Act, is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.

Who must comply with CEQA?

CEQA applies to certain activities of state and local public agencies. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a "project." A project is an activity undertaken by a public agency or a private activity which must receive some discretionary approval (meaning that the agency has the authority to deny the requested permit or approval) from a government agency which may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment.

For additional information please see both the San Jose Planning Division's website at: www.sanjoseca.gov/planning/eir/

Or the State of California's CEQA website at: www.ceres.ca.gov/topic/env_law/ceqa/more/faq.html

Every project, whether public or private is required to obtain either an Environmental Clearance or an Environmental Exemption prior to approval. Although applicants are required to determine if their sites are subject to the 1% or 100-year flood, Public Works staff verifies a project site's FEMA 100-year flood zone designation. Based on that determination and the project proposal, staff provides applicants with detailed comments regarding the site's compliance with the City's Special Flood Hazard Area Regulations.

Through the City's development process, projects may be required to provide additional detailed flooding analyses to determine if the proposed project will induce flooding on adjacent sites as well as cause unnecessary flooding risk to the future site occupants.

In addition to a thorough City review with regard to CEQA and flooding, the City also refers these projects to the Santa Clara Valley Water District for its review and comments.

CITY OF SAN JOSE
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B3 The National Flood Insurance Program (NFIP)

Floodplain Management

What is the National Flood Insurance Program?

The National Flood Insurance Program (NFIP) was created by Congress in 1968 to protect lives and property and to reduce the financial burden of providing disaster assistance. For decades, the national response to flood disasters was generally limited to constructing flood control works such as dams, levees, and the like, and providing disaster relief to flood victims. This approach did not reduce the losses, nor did it discourage unwise development.

The Federal Emergency Management Agency (FEMA) administers the NFIP. Nationwide, over 20,000 communities participate in the NFIP – nearly all of California's flood prone communities participate.

The NFIP is based on a mutual agreement between the Federal Government and communities. Communities that participate agree to regulate floodplain development according to certain criteria and standards. The partnership involves:

- Flood maps. In support of the NFIP, FEMA identifies flood hazard areas throughout the U.S. and its territories by producing flood maps that are used by communities, insurance agents, and others.
- Flood insurance. Property owners in participating communities are eligible to purchase federally-backed flood insurance for buildings and contents. Flood insurance is required for insurable structures within 100-year floodplains to protect Federal financial investments and assistance used for acquisition and/or construction purposes within participating communities.
- Regulations. Communities must adopt and enforce minimum floodplain management regulations so that development, including buildings, is undertaken in ways that reduce exposure to flooding. FEMA uses the 100-year floodplain standard which constitutes a reasonable compromise between the need for building restrictions to minimize potential loss of life and property and the economic benefits to be derived from floodplain development.

Floodwaters surge under the St. John Street bridge in 1995 (HP Pavilion in the background).

Is community participation mandatory?

Community participation in the NFIP is voluntary. Each identified flood prone community must assess its flood hazard and determine whether flood insurance and floodplain management would benefit the community's residents and economy.

If a community chooses NOT to participate in the NFIP, flood insurance and Federal or Federal-related financial assistance is not available under the NFIP for acquisition or construction purposes in a 100-year floodplain.

Also, if a Presidentially-declared disaster occurs as a result of flooding in a non-participating community, no Federal financial assistance can be provided for the permanent repair or reconstruction of insurable buildings in these areas.

How does the NFIP benefit property owners? Taxpayers? Communities?

Through the NFIP, property owners in participating communities are able to insure against flood losses. By employing wise floodplain management, a participating community can protect its citizens against much of the devastating financial loss resulting from flood disasters. Careful local management of development in the floodplains results in construction practices that can reduce flood losses and the high costs associated with flood disasters to all levels of government.

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B3 The National Flood Insurance Program (NFIP)

Nationwide flood information:

1. $2.4 billion per year – Average flood losses in the United States
2. 1,000 – Flood events that have been designated as federally declared disasters in the last 50-years
3. 75% - Percentage of federally declared disasters over the past 5 years that involved flooding

City of San José floodplain and flood insurance data as of July 31, 2007:

1. **20,000** – Estimated number of San Jose properties in FEMA 100-year floodplain
2. **8,448** – Total number of NFIP flood insurance policies in force
    - *93% of the policies are for RESIDENTIAL properties*
    - *9% of the policies are for properties outside the 100-year floodplain*
    - *70% of the policies are for structures built before the City joined the NFIP (1982)*
2. **$6,307,726** – Annual San Jose NFIP flood insurance premiums (2007)
3. **$1,719,520,800** – Amount of flood insurance coverage in force
4. **265** – Total number of flood insurance claims
5. **$3,481,979** – Amount of flood insurance claims

B4 San Jose's flood construction standards

The City of San José has been an active participant in the National Flood Insurance Program (NFIP) since 1982. As stated in Fact Sheet B3, participation in the NFIP is voluntary and is based on an agreement between communities and the Federal Government. If a community adopts and enforces a floodplain management ordinance to reduce future flood risks to new and existing developments in floodplains, the Federal Government will make flood insurance available within the community as a financial protection against flood losses. The City of San José adheres to the NFIP regulations by administering land use and construction permits in conformance with Municipal Code Chapter 17.08, Special Flood Hazard Area Regulations (Flood Hazard Regulations).

Revisions to the City's Flood Hazard Regulations were adopted in February 2006 to recognize the recent changes in San Jose's 100-year floodplains due to the substantial flood improvements provided by the Downtown and Lower Guadalupe Flood Protection Projects (managed by the Santa Clara Valley Water District), and to comply with revised NFIP standards.

The City's Flood Hazard Regulations is based on the NFIP's minimum requirements and, in general, require that new construction, substantially improved or substantially damaged existing buildings in 100-year floodplains must have their lowest floor (including basement) elevated to or above the 100-year flood elevation (the NFIP refers to this as the base flood elevation). Non-residential structures in 100-year floodplains can be either elevated or designed and constructed to be watertight (dry-floodproofed).

Elevated residential structures in Alviso, 2007

Typical flood construction standards for all new and substantially improved buildings in 100-year floodplains:

- All new construction and substantial improvements of **residential buildings** must have the lowest floor (including basement) elevated to or above the base flood elevation.
- All new construction and substantial improvements of **non-residential buildings** must either have the lowest floor (including basement) elevated to or above the base flood elevation or dry-floodproofed to the base flood elevation.
- Buildings can be elevated to or above the base flood elevation using fill, or they can be elevated on extended foundation walls or other enclosure walls.
- The extended foundation walls or other enclosure walls must be designed and constructed to withstand forces from flood waters, otherwise the walls can fail and the building can be damaged. Foundation and enclosure walls must be constructed with flood-resistant materials and contain openings that will permit the automatic entry and exit of floodwaters. These openings allow floodwaters to reach equal levels on both sides of the walls and thereby lessen the potential for damage. Any enclosed area below the 100-year flood elevation can only be used for the parking of vehicles, building access, or storage.
- Building support utility systems such as HVAC, electrical, plumbing, air conditioning equipment, including duct-work, and other service facilities must be elevated above the 100-year flood elevation or protected from flood damage.

B5 Community Rating System (CRS)

The National Flood Insurance Program's Community Rating System (CRS) Program is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community's activities. The CRS is similar – but separate from- the private insurance industry's programs that grade communities on the effectiveness of their fire suppression and building code enforcement.

CRS discounts on flood insurance premiums range from 5% up to 45%. The CRS discount for the City of San Jose is 15% for policies where the property is located within the 100-year floodplain (5% for properties outside the 100-year floodplain). This discount is based on the City's CRS "Class 7" status.

The CRS assigns each participating community to a class based on the total points the community earns from the activities they perform. The CRS activities fall into 4 categories of activities as described below. There are activities under PUBLIC INFORMATION and FLOOD DAMAGE REDUCTION that the water district performs and which San Jose gets credit for.

1. Public Information

- This category includes activities that advise people about the flood hazard, flood insurance, and ways to reduce flood damage.
- San Jose gets credit for the water district's annual floodplain mailer.
- Credit is also given to the City's Flood Information Service which is a free service that benefits not just the property owners but also lenders, insurance agents and real estate agents that need information mostly on flood zones and flood insurance.

Many other California communities participate in the CRS:

	Class
City of Cupertino	8
City of Santa Clara	8
Santa Clara County	8
City of San José	**7**
City of Morgan Hill	7
City of Palo Alto	7
City of Los Angeles	7
City of Milpitas	6
Sacramento County	5

CRS Classification and Premium Reductions		
Class	Within 100-year floodplain (%)	Outside 100-year floodplain (%)
1	45	10
2	40	10
3	35	10
4	30	10
5	25	10
6	20	10
7	15	5
8	10	5
9	5	5
10	0	0

2. Mapping and Regulations

- This category consists of programs that provide increased protection to new development.

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3. FLOOD DAMAGE REDUCTION

- This category includes activities that reduce the flood risk to existing development (ex. Floodplain Management Planning and Acquisition and Relocation of buildings within the 100-year floodplain).
- San Jose gets credit for the water district's routine channel maintenance work which involves sediment removal, erosion repair, and levee maintenance.

4. FLOOD PREPAREDNESS

- This category has 3 activities: flood warning, levee safety, and dam safety projects.

The City and Santa Clara Valley Water District recertifies annually to FEMA that they are continuing to perform the activities that are being credited by the CRS. Recertification includes progress reports for certain activities. A cycle verification takes place usually every 5 years and is conducted in the form of a verification visit each to the City and the water district.

In 2006, Roseville, CA, became the nation's first community to be awarded the highest possible "Class 1" CRS rating. Property owners in Roseville's 100-year floodplain enjoy a 45% discount (10% for areas outside the 100-year floodplain).

B6 FEMA map modernization and levee recertification

Since 1982, the City of San Jose has been an active member of the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP). Fact sheet B3 provides additional information about this program. One of the key products that FEMA produces for communities is a map of the location of the regulated 100-year floodplain. Properties within the regulated 100-year floodplain are subject to special building standards and requirements for flood insurance. The maps are officially called Flood Insurance Rate Maps (FIRMs) and commonly called flood maps.

The flood maps were originally produced by FEMA in the 1980s and are intended to show areas that do not have flood protection from the 100-year flood. The original and current maps are paper maps and sometimes are difficult to read and interpret. With the initial production of maps, FEMA grandfathered in some older flood protection structures such as levees without a rigorous examination of the actual capacities of those structures. Periodically FEMA updates the flood maps in Santa Clara County, usually when a new flood protection structure is constructed, removing property from the regulated 100-year floodplain (e.g. Downtown San Jose adjacent to the Guadalupe River Flood Protection Project). Occasionally, FEMA would sponsor a special study to examine a flood protection structure (e.g. Alamitos levee) to determine if it provided 100-year flood protection and if not, FEMA would add the surrounding area into the regulated 100-year floodplain. Nationally many difficulties with FEMA's maps were recognized and as a result, Congress authorized a Map Modernization Program.

In 2005, FEMA launched its Map Modernization Program in Santa Clara County. This effort will digitize the flood map information and be compatible with GIS systems. In 2006, FEMA decided that levees and levee-like structures should be examined to determine if these structures function as intended and this effort is called levee recertification.

Central Valley, California, Levee Failure, 2006.

Anticipated status of levee recertification effort in San José

FEMA identified four levees in San Jose, owned by the water district, for initial evaluation.

1. Guadalupe River (Highway 101 to Highway 237): No changes to the flood maps are expected. Accreditation is anticipated.
2. Thompson Creek (Aborn Road to Quimby Road): No changes to the flood maps are expected. Accreditation is anticipated.
3. Coyote Creek (Trimble Road to the Water Pollution Control Plant): FEMA previously required additional documentation to recertify this levee. In June 2007, the City Council signed a resolution authorizing the execution of an agreement (called Provisionally Accredited Levee or PAL agreement). This agreement provides City staff 24-months to acquire and/or assemble the required documentation to be submitted to FEMA, in coordination with the Santa Clara Valley Water District, that is required to update the certification for this levee. FEMA recently notified the City and the water district that this levee will be accredited. Therefore, no changes to the flood maps are expected.

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4. San Tomas Aquino Creek (San Tomas Aquino Road to Westmont Avenue): This levee was built in the early 1980's prior to current FEMA standards being established. While the levee is maintained properly, it does not have the freeboard (factor of safety usually expressed in feet above a flood level) that is currently required. Extensive changes to the levee would be needed to add the freeboard. Accreditation of the levee, meeting current standards, is not possible at this time. Changes to the flood maps will not be known until FEMA releases the maps for review. Therefore, the number of parcels affected by this change is not known at this time.

Status of levee-like structures in San Jose

FEMA identified 13 levee-like structures in San Jose which are roadways or railway embankments owned by a variety of entities. Information provided to FEMA showed that these structures did not create flood depths needing further regulation or insurance. Preliminary feedback from FEMA indicates that no changes to the flood maps are expected surrounding levee-like structures.

Status of map modernization

It is anticipated that FEMA will issue preliminary digital flood maps in October 2007. These maps will show changes to some areas due to the examination of levees and levee-like structures. A 30-day review of these preliminary maps will allow local evaluation of the map changes prior to public release.

A Look to the Future

Both FEMA and the Army Corp of Engineers are anticipating periodic assessments of flood protection structures, particularly levee systems. In a letter to the Santa Clara Valley Water District, dated September 25, 2007, FEMA makes the following observations:

- Levees are designed to provide a specific level of protection.
  - Overtopping and failure are possible in larger flood events.
- Levee systems require regular maintenance and periodic updates.
- Land use agencies should monitor impacts of development that may lead to increased runoff during storm events.
- Land use agencies should closely monitor land uses to assure new development does not compromise flood protection systems.
- Everyone needs to understand the risk of life and property behind levees.

Based on this feedback, the City will evaluate its process to respond to any future FEMA/Army Corps requirements.

B7 Proposed state legislation related to flooding

There are several pending flood management legislations in both the State of California's Senate and Assembly. Although most of them only affect the Central Valley at this time, some of these bills may impact local jurisdictions, like the City of San José, in the future.

The following are brief summaries of some of the flood management legislations provided by the State's Department of Water Resources (DWR). These bills are mostly aimed to reduce flood risk in the Central Valley where there are estimated 200,000 structures and 500,000 people that are vulnerable to flooding.

1. Assembly Bill No. 162 (Wolk) Land Use: Water Supply

- This bill would require that the land use element of a city or county's general plan identify specific areas subject to flooding. It would require that the conservation element of general plans identify rivers, flood corridors and other land that may accommodate floodwater, and would require cities and counties to establish policies to minimize flood risk for new development. The bill would also require cities and counties, when revising the safety element, to consult with the Reclamation Board.
- Introduced in January 22, 2007, this bill was signed by the Governor on September 27, 2007.

2. Assembly Bill No. 5 (Wolk) Flood Protection: Local Plans

- This bill makes changes to provisions of law being added or amended by three bills that all relate to flood management. The bills that would be amended by the provisions of AB 5 include SB 5 (Machado) relating to flood protection, SB 17 (Florez) relating to the Reclamation Board and AB 156 (Laird) relating to flood control.
- Introduced in December 4, 2006, this bill was last amended in the Assembly on September 7, 2007 and was sent to the Governor's office for approval on October 1, 2007.

3. Senate Bill No. 5 (Machado) Flood Management

- This bill states the intent of the Legislature to develop a comprehensive integrated flood policy that addresses all aspects of flood management, including changes in land use planning and the need for a State Plan of Flood Control (refers to the state and federal flood control works, lands, programs, plans, conditions, and mode of maintenance and operations of the Central Valley's Flood Control Projects).
- Over the next eight years, this bill aims to limit development in areas without 100-year flood protection. After 2015, development would not be allowed in areas without 200-year flood protection.
- This bill is contingent upon enactment of AB 162 and SB 17. DWR further recommends that this bill be contingent upon enactment of AB 5.
- Introduced in December 4, 2006, this bill was sent to the Governor's office for approval on September 12, 2007.

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4. Assembly Bill No. 17 (Florez) Flood Protection

- This bill would recast various provisions of law regarding the Reclamation Board and its operations, renaming it the Central Valley Flood Protection Board, increasing the Board's membership and placing new requirements on the Board regarding its prescribed duties.
- Introduced in December 4, 2006, this bill was sent to the Governor's office for approval on September 12, 2007.

5. Assembly Bill No. 156 (Laird) Flood Control

- This bill would make changes to various provisions of law relating to DWR's flood management activities, including mapping of areas at risk of flooding, preparation of a status report on the State Plan of Flood Control, notification of property owners at risk of flooding, environmental enhancement activities, and maintenance area formation.
- Introduced in January 18, 2007, this bill was sent to the Governor's office for approval on September 28, 2007.

6. Assembly Bill No. 70 (Jones) Flood Liability

- This bill would provide that a city or county may contribute a fair and reasonable share of the increased flood damage caused by its unreasonable approval of developments following the failure of a state flood control project (any flood control works within the Sacramento River Flood Control (SRFC) Project and the flood control projects in the Sacramento River and San Joaquin River Watersheds). This bill would apply only to decisions made by local governments after January 1, 2008.
- Introduced in December 4, 2006, this bill was sent to the Governor's office for approval on September 26, 2007.

B8 Levels of risk – frequency of the 100-year flood

Cities and counties throughout California consider different levels of risk or exposure to risk in planning for the location of different types of land uses or approving individual building plans. Land uses are often located away from higher risks and buildings are required to use certain building methods to lower the risk of structural failure from those hazards such as earthquake, flood and fire.

The following are definitions and calculations which better help to define flood risk and the possibility of experiencing a flood in a flood prone area. Structures within a 100-year flood plain without flood protection have a 26% chance of being flooded during the same time period. The policy question to consider is if this exposure to flood risk is acceptable?

By Definition

Probability of a 100-year flood occurring in a given year = 1/100

Therefore

Probability of a 100-year flood ***not*** occurring in a given year = (1 - 1/100)

Probability of a 100-year flood ***not*** occurring in 30 years = (1 - 1/100) ^ 30 = 0.7397 = 74%

Probability of a 100-year flood occurring at least once in the next 30 years = 1 - 0.7397 = 26%

Adapted from "Frequency of a 100-Year-Flood" as contained in the California Water Plan Update 2005 (www.waterplan.water.ca.gov/docs/cwpu2005/vol4/vol4-hydrology-frequencyof100yearflood.pdf)

Flood hazard

Many Californians have a false sense of safety from floods due to incomplete information. Current flood threats are higher than commonly thought; the term "100-year flood," for example, is misleading. It does not denote a flood that will occur only once every 100 years, as is commonly believed. Rather, it is the flood elevation (or flow) that has a one percent chance of being equaled or exceeded each year. "Over the lifetime of a 30-year mortgage, there is a 26-percent chance of being flooded by a 100-year flood" if a structure is located within the 100-year flood plain.

Fire hazard

In recent years building codes have been modified and construction has provided measures which has significantly lowered the risk of fire in a home. According to FEMA's floodsmart webpage (www.floodsmart.gov), the average home has a 9 % chance of being damaged by a fire during the course of a 30-year mortgage.

C1 Natural flood protection

A multi-objective approach to flood protection; a method for project evaluation and selection

A river conveys water, sediment and energy and supports a dynamic web of life. A superior river corridor design accommodates all of these functions. Earlier flood protection works typically focused primarily on conveying water — large amounts of water — often to the detriment of the environment and, eventually, to the life of the works themselves.

Once a flood protection project is ranked as a high priority (according to criteria outlined in Fact Sheet C3), then the water district evaluates a number of alternative designs. It is the aim of the water district to balance a variety of objectives to help define the final design for a particular project. To do this, the water district uses a planning and decision-making framework to describe the functions and features of multi-objective river project. Termed "natural flood protection," the framework aims to balance natural resource protection with property protection, community benefits and costs.

Projects are designed and evaluated to best meet these criteria:

1. Flood protection
   Focuses on providing protection to lives and property against the potential damages from flood events.
2. Ecology
   Examines the potential to protect, enhance, or restore the natural resource benefits of streams and the watershed in ecological terms.
3. Geomorphology/stable channel
   Addresses the ability to effectively manage water and sediment from the watershed under both extremely high flows and routine low flows.
4. Maintenance
   Focuses on minimizing the long-term obligation of operating and maintaining projects once they are constructed.
5. Watershed context
   Assesses how appropriate a project is to its location within the watershed and the physical, ecological and social contexts.
6. Water quality and quantity
   Addresses water-supply related goals, including quality and quantity of surface and groundwater associated with streams.

7. Local partner agencies
   Measures how effectively a potential project meets goals of both the water district and the partner communities/agencies affected by the project.
8. Community benefits
   Addresses the full range of community benefits beyond flood protection that might be integrated into a creek project.
9. Life-cycle costs
   Examines project costs as a long-term investment rather than a one-time cost.

Applying the framework

When alternatives are being evaluated, the water district conducts biological surveys, assesses existing flooding impacts to the community and attempts to understand any maintenance issues on the existing channel. A project planning team will use its knowledge of the natural flood protection objectives, the local system, and input from the community to apply weighting factors to the nine objectives and design a system that optimizes those objectives most important to support the local watershed and community. A formal rating system using the criteria is then applied to the slate of feasible alternatives, to assess their attainment of the individual objectives with emphasis on the higher-weighted objectives. This method is used to select and justify the project alternative that provides the best balance between natural resource protection, property protection, community benefits and costs.

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C2 South San Francisco Bay Shoreline Study

Overall project goal

Restore up to 25 square miles of habitat, provide flood protection to urban areas adjacent to the South San Francisco Bay, and provide public access and recreation.

Description

The project's goals are:

- Creation of the largest restored wetland on the West Coast of the United States with extensive habitat for federally endangered species and migratory birds, and enhanced public access.
- Build levees to provide flood safety and elimination of flooding from a 1-percent high tide for low-lying areas of Santa Clara and Southern Alameda Counties.

Existing federally-owned salt pond levees are structurally uncertain, restoration may expose these levees to tidal influence. Levee overtopping occurs during extreme high tides. Tidal flooding is potentially aggravated by significant land subsidence that left some areas up to 13 feet below sea level. Projected rises in sea level will only raise the possibility of flooding in this area.

The U.S. Army Corps of Engineers' (Corps) February 1981 San Francisco Bay Shoreline Study Interim Office Report for Southern Alameda and Santa Clara Counties estimated $34.5 million (1981 value) in flood damages in Santa Clara County for a 1-percent high tide. The 1981 flood damage estimate is being updated with the current Shoreline project. In addition to inflationary cost increases over time, the area has experienced significant construction related to core industries and regionally significant infrastructure.

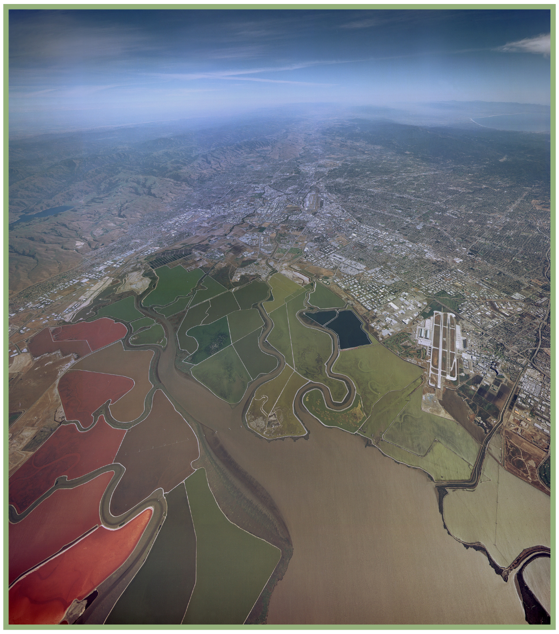
Project funding and partnership

Study partners

Corps; State Coastal Conservancy; Santa Clara Valley Water District (District).

Cooperating entities

U.S. Fish and Wildlife Service; Hewlett Foundation; Packard Foundation; Moore Foundation; State Department of Fish and Game; Alameda County Flood Control and Water Conservation District.



Aerial view of South San Francisco Bay Shoreline.

Acquisition

State of California, $72 million; U.S. Fish and Wildlife Service, $8 million; and Hewlett, Packard, and Moore Foundations, and Goldman Fund, $20 million.

Salt pond restoration planning

State of California, $8 million, plus significant funding for land management; Hewlett, Packard, and Moore Foundations, $15 million ($6 million for restoration planning and $9 million for land management); the District, $500,000 in Fiscal Year 2005.

Feasibility study

State of California, $1 million; the District, $6.8 million; and the Corps, $7.8 million

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C2 South San Francisco Bay Shoreline Study

Demographics

- Homes and businesses in low-lying parts of Palo Alto, Sunnyvale, San Jose, and the community of Alviso are in danger of flooding by high tides.
- Area includes NASA/Ames Research Center, federal buildings at Moffett Field and Silicon Valley's Golden Triangle, home to high-tech world leaders.
- 1981 Corps report estimates Santa Clara County's tidal floodplain encompasses nearly 4,700 acres, including 5,179 structures and roads, highways, parks, airports, and sewage treatment plants.
- Substantial development has occurred in the area since 1981, greatly increasing the original damage estimate from a 1-percent high tide flood.

Status

- Authorization for original study granted by the Water Resources Development Act of 1976.
- The Corps' 1981 study assumed no change in the hydrologic regime of the Baylands. However, the proposed restoration of the salt ponds to tidal marsh and other related habitats will substantially alter the hydrology.
- October 1988 Office Report of Southern Alameda County and Santa Clara County Study Area San Francisco Bay Shoreline Study identified $15 to $20 million for necessary levee construction in Palo Alto, Sunnyvale, and Alviso.
- In July 2002, Congressionally authorized for review of the Final Letter Report (July 1992).
- Corps Reconnaissance Study initiated in Fiscal Year 2004.
- In September 2004, Corps' South Pacific Division approved the Reconnaissance Study confirming a federal interest in the project.
- Feasibility Cost Sharing Agreement signed by Corps and nonfederal sponsors State Coastal Conservancy and the District in September 2005.
- Corps Feasibility Study scoping meeting held January 25, 2006.
- During development and implementation of a long-term restoration and flood protection plan, interim levee maintenance will be required to ensure that federally-owned levees are safe and flooding from unplanned levee degradation and failure is avoided.
- Corps Work Plan allocation of $1.3 million in Fiscal Year 2007.

Funding to implement the plans for restoration and flood protection have not been secured.

Funding request: U.S. Army Corps of Engineers

- An appropriation add-on of $2.5 million is requested in Fiscal Year 2008 to continue the Feasibility Study to evaluate integrated flood protection and environmental restoration options for South San Francisco Bay.

Funding request: U.S. Fish and Wildlife Service Don Edwards San Francisco Bay National Wildlife Refuge (Refuge)

- An appropriation add-on of $6 million, in addition to the $1 million included in the Fiscal Year 2008 Administration budget request, for a total of $7 million is needed to provide the staffing, operations and maintenance of the Refuge, levee maintenance, and to match State funds for implementation of Phase I of the restoration. If sufficient funding is not received, then levee maintenance will fall behind schedule. It is likely that levees would degrade significantly, potentially threatening public safety in adjacent urban areas.

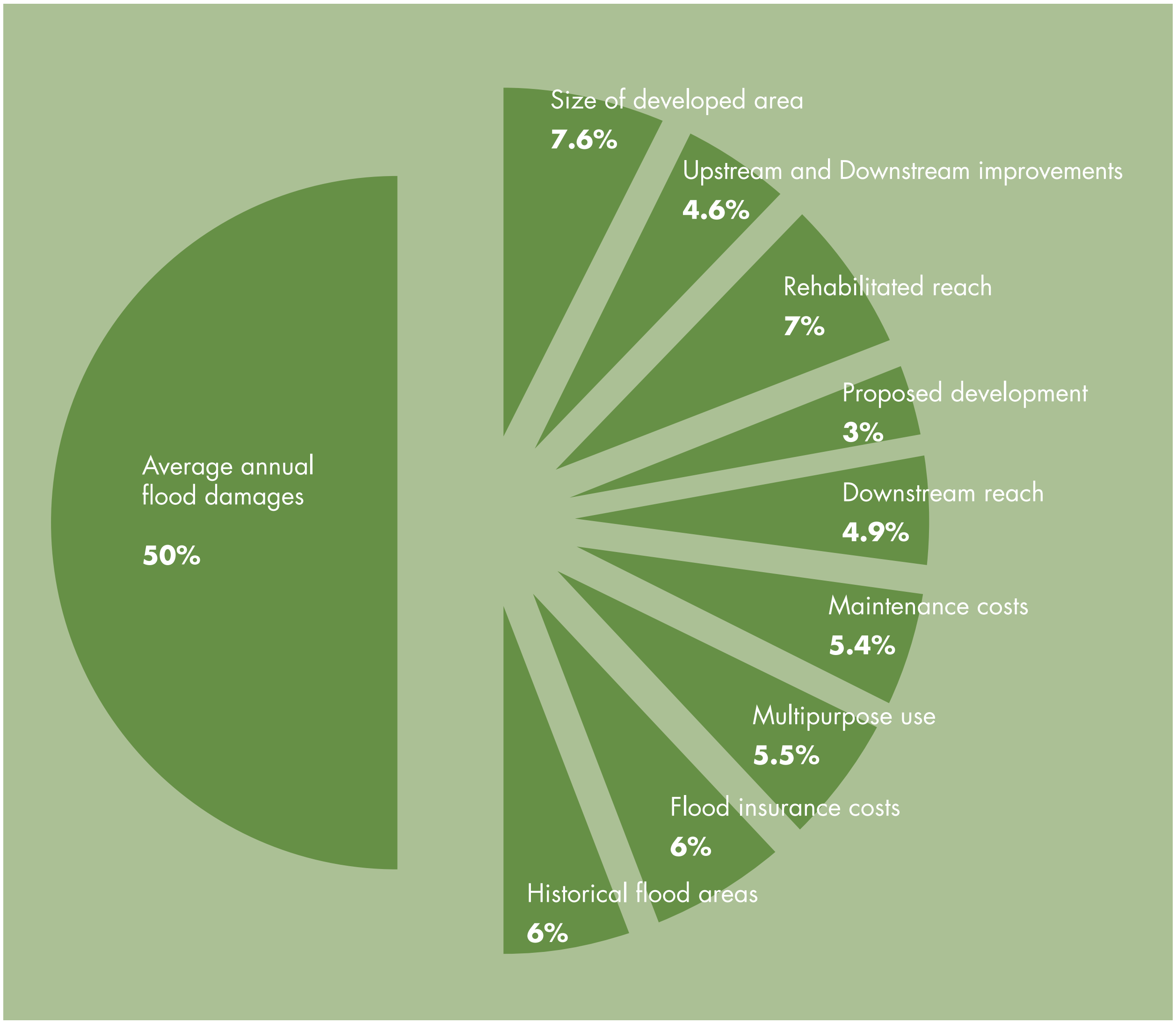
Funding request: U.S. Geological Survey (USGS)

- An appropriation add-on of $900,000 to fund USGS Biological Research and Monitoring budget for interdisciplinary monitoring (biological, hydrological, and water quality studies) of North and South Bay salt ponds. Funding is urgently needed to provide a sound scientific and technical basis for restoration planning and implementation.

C3 Flood protection project prioritization

How are flood protection projects prioritized by the Santa Clara Valley Water District?

The water district uses a method to evaluate proposed flood protection projects and determine their priority for funding and construction. The water district's goal is to reduce the potential for flood damage and therefore this is the highest weighted factor. While there may be many locations within the county that may experience flooding, this prioritization method provides a means to determine the order that flood protection measures may be constructed. Definitions of the prioritization terms shown in the chart below are provided on the back.



CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Santa Clara Valley Water District℠

C3 Flood protection project prioritization

Definition of prioritization terms

Average annual flood damages

Dollars of prevented annual damage: the calculated flood cost is the financial estimate of damage to structures and their contents within a projected flooded area plus indirect damages (i.e. income lost), plus clean up costs, and the frequency at which this projected loss may occur. The greater the estimated cost, the higher the rating.

Size of developed area

Acres of developed land to be protected from flooding: the size of the flood plain to be protected. The larger the protected area, the higher the rating.

Upstream and Downstream improvements

Construction of reaches of inadequate channel between previously improved reaches of the same channel: the presence of specific attributes about the project. Points can only be gained in this category if a proposed flood protection measure completes a continuous flood protection strategy along a stream.

Rehabilitated reach

Provide for rehabilitation of previously constructed reaches over new construction: the presence of specific attributes about the project. Points can only be gained in the category if a proposed flood protection measure rehabilitates an older inadequate reach.

Proposed development

Acres currently vacant land, proposed for development, to be protected: an estimate of the amount of acreage of future development in a currently undeveloped area that would be protected by the project. The greater the acreage of development protected, the higher the rating.

Downstream reach

Miles of downstream channel is the distance from the bay: the closer a project is to the bay, the higher the rating.

Maintenance costs

Dollars to maintain existing channel per reach: a calculation of potential maintenance costs of the pre-project stream channel. This criterion only applies to stream segments on which the water district has a right of way; the higher the cost, the higher the rating. If the water district does not currently own the right of way where a flood protection project is proposed, no points would be applied for this category.

Multipurpose use

Number of miles or acres of land to be used jointly for recreation, groundwater recharge, trails, etc.: the presence of specific attributes about the project. The existence of trail miles or acres projected for joint use is the basis for this criterion; the higher the amount, the higher the rating.

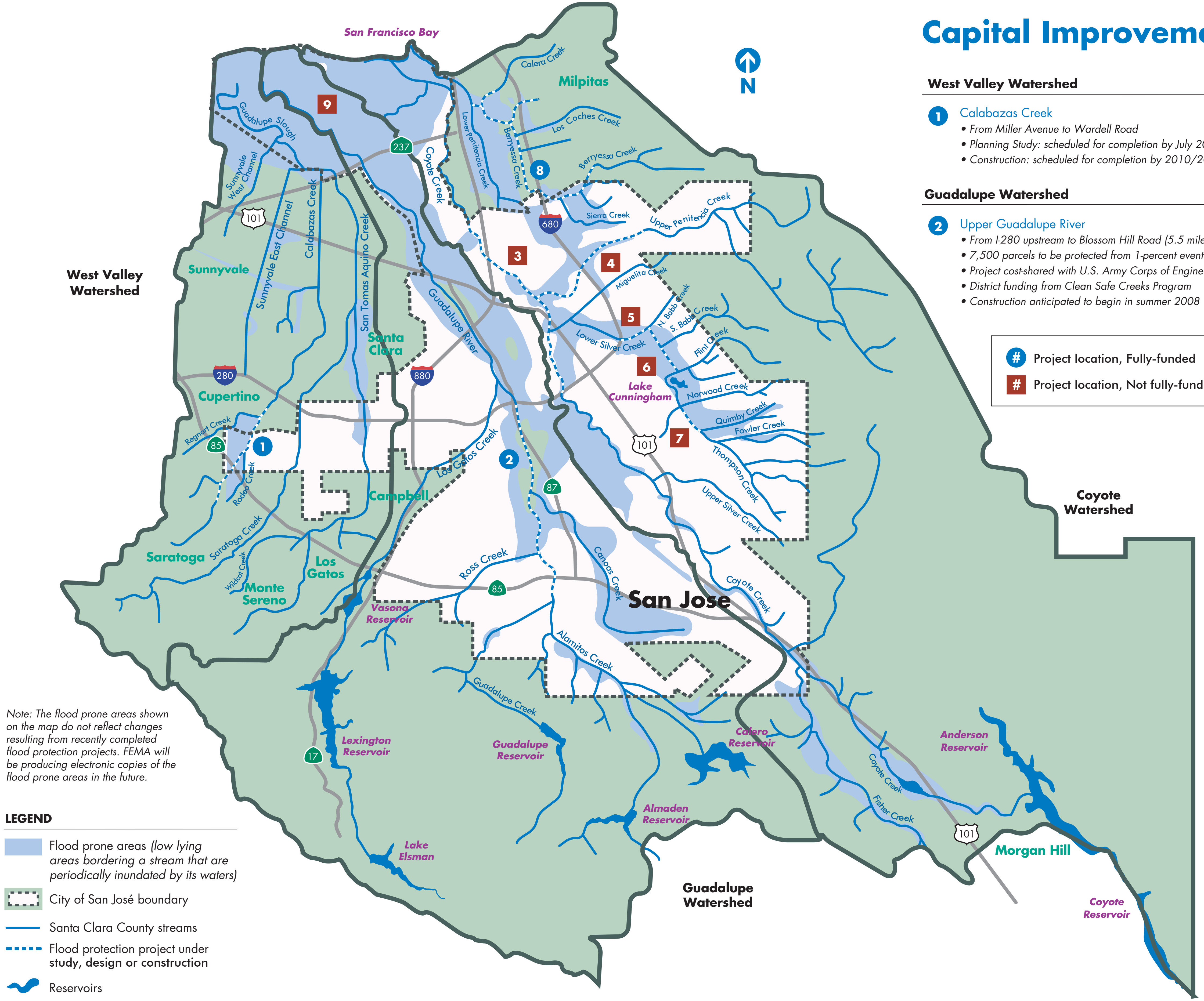
Flood insurance costs

Dollars to be saved in insurance premiums: a calculation of the annual pre-project flood insurance expenditures. This is a calculation of the current total insurance premiums paid on an annual basis by property owners within the area projected for flood protection. The higher the premiums, the higher the rating. This category assumes the possibility of providing flood protection for a 100-year calculated flood flow.

Historical flood areas

Acres historically flooded: acres of land that have actually experienced flooding within the past 50 years. The larger the acreage, the higher the rating.

C4 Planned flood protection projects



Note: The flood prone areas shown on the map do not reflect changes resulting from recently completed flood protection projects. FEMA will be producing electronic copies of the flood prone areas in the future.

LEGEND

🟦	Flood prone areas *(low lying areas bordering a stream that are periodically inundated by its waters)*
⬚	City of San José boundary
—	Santa Clara County streams
┅	Flood protection project under study, design or construction
〰	Reservoirs

Capital Improvement Program Projects

West Valley Watershed

① Calabazas Creek
- *From Miller Avenue to Wardell Road*
- *Planning Study: scheduled for completion by July 2008*
- *Construction: scheduled for completion by 2010/2011*

Guadalupe Watershed

② Upper Guadalupe River
- *From I-280 upstream to Blossom Hill Road (5.5 miles)*
- *7,500 parcels to be protected from 1-percent event*
- *Project cost-shared with U.S. Army Corps of Engineers*
- *District funding from Clean Safe Creeks Program*
- *Construction anticipated to begin in summer 2008*

#	Project location, Fully-funded
#	Project location, Not fully-funded

Coyote Watershed

3 Coyote Creek
- *From Montague Expressway upstream to I-280 (6.1 miles)*
- *District funding is from Clean, Safe Creeks Program*
- *Estimated funding gap: Construction partially funded*
- *Project team is identifying conceptual project alternatives*
- *Partial construction anticipated to begin in 2013*

4 Upper Penitencia Creek
- *From Coyote Creek to Dorel Drive (4.2 miles)*
- *Over 5,000 parcels currently subject to 1-percent flooding*
- *Project cost-shared with U.S. Army Corps of Engineers*
- *District funding is from Coyote Watershed Funds*
- *Currently evaluating feasible alternatives and preparing environmental documents*
- *Estimated funding gap: $36M*

5 Lower Silver Creek
- *From I-680 to Cunningham Avenue (2.2 miles)*
- *Over 5,100 parcels currently subject to 1-percent flooding*
- *Creek improvements will work in tandem with proposed Lake Cunningham modifications*
- *Estimated funding gap: $59M (includes item #6)*

6 Lake Cunningham
- *Improvements will increase lake's detention capacity to provide 1-percent protection to Lower Silver Creek from Cunningham Avenue downstream to its confluence with Coyote Creek*
- *Lake modifications will work in tandem with d/s creek improvements*
- *Estimated funding gap included in item #5*

7 Thompson Creek
- *From Quimby Road to Aborn Road*
- *Joint study with Army Corps*
- *Estimated funding gap: Design and construction unfunded*

⑧ Upper Berryessa Creek
- *From Calaveras Blvd to Piedmont Road (partially in City of Milpitas)*
- *3,000 parcels currently subject to 1-percent*
- *Project cost-shared with U.S. Army Corps of Engineers*
- *District funding is from Clean, Safe Creeks Program*
- *Currently evaluating feasible alternatives and preparing environmental documents*
- *Construction anticipated to begin in 2011 or 2012*

Shoreline

9 South San Francisco Bay Shoreline Study
- *Along the shoreline from San Francisquito Creek to Coyote Creek*
- *Over 4,000 parcels and infrastructure (three wastewater treatment plants, three major highways, airports, and parks) currently subject to 1-percent tidal flooding.*
- *Project cost-shared with U.S. Army Corps of Engineers and State Coastal Conservancy*
- *Estimated funding gap: $750M*
- *Currently engaged in feasibility study; Chief's Report expected in 2011*

CITY OF SAN JOSE
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Santa Clara Valley Water District

C5 Overview of Stream Maintenance Program

Maintaining the capacity of creek channels to carry floodwaters away from homes and businesses in an environmentally sensitive manner is one of the water district's core services. Its 10-year stream maintenance permit helps ensure that the maintenance of its flood protection infrastructure takes place in a timely and systematic manner.

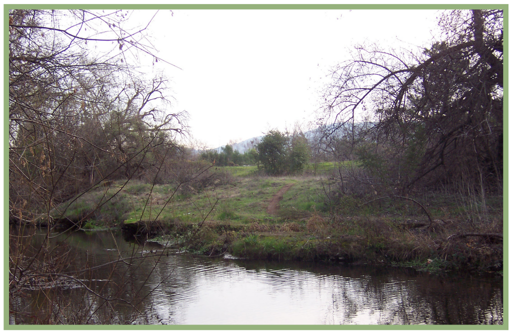
In the first five years of this permit, the water district has removed significant amounts of sediment, invasive vegetation, trash and debris and repaired eroded creek banks. This same work has also created more natural conditions for fish, plants and wildlife. Specifically to:

- Remove an average of 62,000 cubic yards of sediment
- Repair or restore 4,300 linear feet of creek bank
- Inspect more than 90 miles of levees and 300 miles of creeks
- Manage more than 3,000 acres of vegetation for fire prevention, invasive species and flood protection
- Conduct hundreds of biological surveys of fish and wildlife

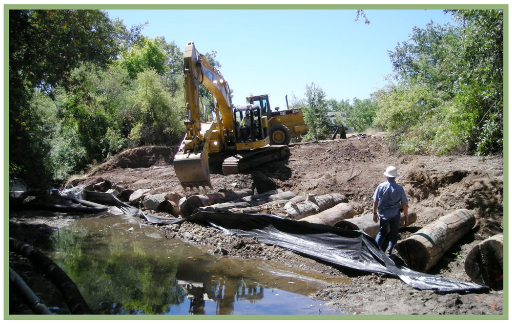
The program is the result of collaboration with regulatory agency representatives, community organizations and civic leaders to ascertain the scope of needed work, potential impacts to the riparian environment and what additional work the water district will do to create new habitat.

To "mitigate" for working in the streams, the stream maintenance program is preserving 820 to 1,080 acres for stream and watershed protection, creating 30 acres of tidal wetlands and 14 acres of freshwater wetlands, controlling giant reed on the equivalent of 125 acres of streams and eradicating 10 acres of smooth cordgrass throughout the county.

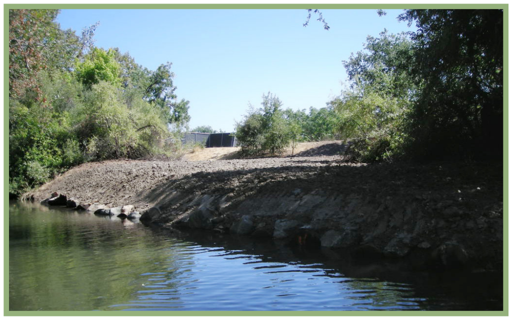
> *"This 10-year program is an example of the way business should be done in the regulatory arena. It's also an example of the 'new environmentalism' that focuses on consultation, communication and cooperation — all in the service of conservation"*
>
> *Craig Manson, former assistant secretary for fish, wildlife and parks for the U.S. Department of Interior*



Before: *Sediment build-up and bank erosion along Alamitos Creek.*



During: *Excavator used at construction site.*



After: *Sediment removed and bank repaired, improving the creek's capacity to carry floodwaters.*

The water district performs stream maintenance activities under annual permits from various regulatory agencies, including the U.S. Army Corps of Engineers, California Department of Fish and Game, and the San Francisco and Central Coast regional water quality control boards.

CITY OF SAN JOSE
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Santa Clara Valley Water District

C6 Performance metrics

Approximately 200 miles of creek channels within the county have been modified to be able to provide flood carrying capacity to meet FEMA standards, stability and sediment transport needs. The Santa Clara Valley Water District annually inspects its flood protection assets to determine maintenance and repair needs. The water district board has a series of performance metrics and reviews these metrics on a quarterly basis. The metric related to maintenance is:

Watershed	Modified creeks (miles)	Percentage of Modified creek miles maintained at Design Capacity
Lower Peninsula	30	99.4%
West Valley	40	96.7%
Guadalupe	40	96.2%
Coyote	50	99.7%
Uvals/Llagas	40	92.0%
Total	200	96.8%

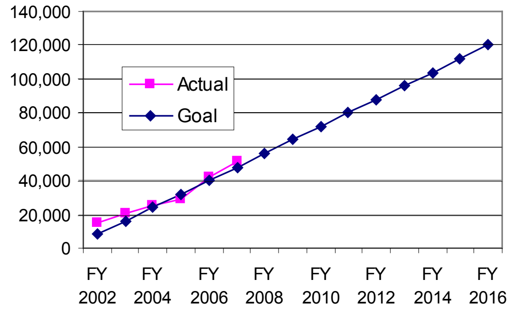
95-97% of modified channels at design capacity and plans and resources for improvement are in place within budget and on schedule.

Overall the water district exceeds its performance standard while needing minor improvements in the Uvas/Llagas watershed which will be addressed with a capital project. This metric combines many types of activities including sediment removal and vegetation management. The table above summarizes percentage of miles of modified creeks that meet design capacity by watershed as of the end of fiscal year 2007.

The Clean, Safe Creeks plan also has performance metrics which are reported to an Independent Monitoring Committee as well as the water district board. More specific activities included in the metrics noted above are provided with Clean, Safe Creeks monitoring. For instance, Clean, Safe Creeks funds 10% of the total sediment removal costs and reports on 10% of the annual and cumulative accomplishments. Total sediment removal was 9,200 cubic yards in fiscal year 2007.

Sediment Removal		
Fiscal Year	Annual (cubic yds)	
	Planned	Actual
2001 - 2002	8,000	14,700
2002 - 2003	8,000	5,700
2003 - 2004	8,000	4,600
2004 - 2005	8,000	3,700
2005 - 2006	8,000	13,000
2006 - 2007	8,000	9,200
Total	48,000	50,900

Cubic Yards of Sediment Removed*
Program-to-Date
*Portion funded by Clean, Safe Creeks



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CITY OF SAN JOSE
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Santa Clara Valley Water District℠

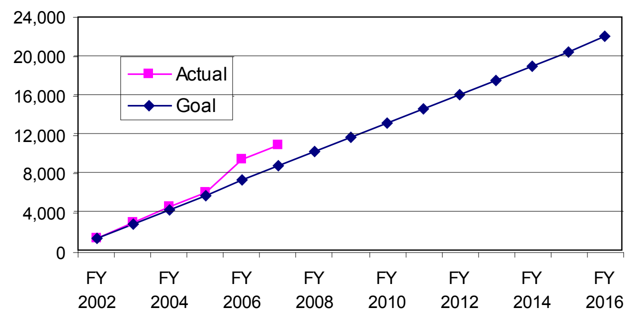
C6 Performance metrics

Clean, Safe Creeks funds 40% of vegetation management in all watersheds except the Uvas/Llagas watershed where it funds 60% of this effort. The following metric reports the accomplishments related to Clean, Safe Creeks efforts.

Vegetation Management

Fiscal Year	Annual (acres)	
	Planned	Actual
2001 - 2002	1,467	1,168
2002 - 2003	1,467	1,504
2003 - 2004	1,467	1,537
2004 - 2005	1,467	1,561
2005 - 2006	1,467	3,591
2006 - 2007	1,466	1,481
Total	8,801	10,842

Acres of Vegetation Removed or Maintained



The Santa Clara Valley Water District has a Total Organization Performance Plan which includes the following additional goals:

- Implementing an asset management program for Watershed Operations
- Effective public outreach and education for flood hazard awareness and preparedness, and for maintaining and increasing the Community Rating System credits
- Preparedness for effective response during storm events

C7 Stakeholder involvement in flood protection efforts

The Santa Clara Valley Water District involves stakeholders in the consideration of flood protection measures. The following are three examples of stakeholder groups related to waterways within San Jose. In addition to these major efforts, water district representatives regularly meet with business, neighbors and city staff members to communicate plans and hear comments and ideas. Community members who are immediately adjacent to projects are surveyed to hear and understand their assessment of flood protection work. Please see fact sheet C8 for results of these surveys.

GUADALUPE RIVER FLOOD-PROTECTION PROJECT

In August 1997, the U.S. Army Corps of Engineers, City of San Jose, San Jose Redevelopment Agency and Santa Clara Valley Water District agreed to undertake a collaborative process to resolve and balance project issues. The goal of the collaborative was to: 1) minimize and mitigate for loss of shaded riverine aquatic habitat, 2) avoid water-temperature increases within the project area, 3) avoid loss of steelhead trout/Chinook salmon habitat and 4) mitigate for loss of cold- and warm-water fisheries habitat.

The collaborative process was formalized with creation of the Guadalupe River Flood Control Project Collaborative, a team of policy-level managers from the U.S. Fish and Wildlife Service, state Water Resources Control Board, National Marine Fisheries Service, Natural Heritage Institute representing several environmental organizations, state Department of Fish and Game, San Francisco Bay Regional Water Quality Control Board, the Corps' Sacramento District, City of San Jose, San Jose Redevelopment Agency and Santa Clara Valley Water District.

The collaborative set the following objectives to achieving a successful, long-term resolution to the issues mentioned above: 1) redesign the project to avoid project-caused adverse effects or to minimize unavoidable effects, 2) maximize on-site mitigation vegetation in shaded riverine aquatic cover, 3) replace the quality as well as the quantity of impacted shaded river aquatic habitat and 4) take an adaptive approach for long-term project management of operation and maintenance of the completed project.

In July 1998, the Corps and the water district agreed to redesign a portion of the project and to revise the mitigation plan. Accordingly, the members of the collaborative executed a Dispute Resolution Memorandum. The Corps and the water district, in coordination with environmental regulatory agencies and the collaborative, then refined the project modifications to satisfy the federal Endangered Species and Clean Water acts, and developed an acceptable mitigation and monitoring plan.

The redesigned project and associated plans were offered for public input at scoping meetings in 1999, and the General Re-evaluation and Environmental Report, including an Environmental Impact Report and Supplemental Environmental Impact Statement, were approved by the Corps in 2001.

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C7 Stakeholder involvement in flood protection efforts

GUADALUPE WATERSHED INTEGRATION WORKING GROUP

The Guadalupe Watershed Integration Working Group, or GWIWG, convened in early 2002, succeeding the Guadalupe River Flood Control Project Collaborative following its successful modification of the project to address environmental concerns. GWIWG was established as a continuation of the collaborative to coordinate watershed-wide technical reviews and analyses of multiple projects and programs currently being implemented within the Guadalupe Watershed. Such coordination aims to minimize duplication of effort and develop consensus among regulatory agencies and project proponents based on scientifically-sound information.

This working group strives to move beyond a project-by-project focus and apply a more comprehensive watershed-wide perspective to project decisions. GWIWG consists of representatives from the Santa Clara Valley Water District, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration (Fisheries), San Francisco Bay Regional Water Quality Control Board, California Department of Fish and Game, City of San Jose and Natural Heritage Institute, representing the Guadalupe-Coyote Resource Conservation District.

COYOTE WATERSHED INTEGRATION WORKING GROUP

Coyote Watershed Integration Working Group
The Coyote Watershed Integration Working Group, or CWIWG, was formed in 2004. The main purpose of CWIWG is to serve as an advisory committee to staff to coordinate and integrate projects and environmental monitoring within the Coyote Watershed. This applies to all projects which could impact water resources and associated habitat.

CWIWG membership include representatives from the City of San Jose, City of Milpitas, County of Santa Clara, Guadalupe Coyote Resource Conservation District, Santa Clara Valley Water District, Regional Water Quality Control Board, U.S. Fish and Wildlife Service, state Department of Fish and Game, National Marine Fisheries Service, the regulatory branch of the U.S. Army Corps of Engineers, Santa Clara Valley Transportation Authority and U.S. Environmental Protection Agency.

ALVISO AND LOWER GUADALUPE COLLABORATIVE

In December 2004, representatives from the water district, and the Alviso Water Task Force signed a document entitled Alviso and Lower Guadalupe Collaborative (Collaborative). The document provided a framework defining a collaborative process based upon a mutual wish to work together, to build trust, and to achieve a successful implementation of Alviso projects.

The primary goal of the Alviso Water Task Force is to work collaboratively with individuals and agencies to develop projects that combine effective flood protection, wildlife, habitat enhancement and restoration, and recreation and quality of life improvements in and around the community of Alviso.

The Collaborative Principles accepted by the task force and the water district are as follows:

1. The Collaborative was formed to collectively work toward effective flood protection, habitat enhancements and restoration, and recreation in the Alviso area. The Collaborative participants include water district staff and the Alviso Water Task Force, which consists of Alviso residents, interested parties, and legislators.
2. The members of the Collaborative understand that there are a multitude of projects such as the Lower Guadalupe Flood Protection Project and the Alviso Slough Restoration Project. These Collaborative principles describe how the Collaborative will work together to successfully achieve Alviso project goals.
3. The Collaborative understands that it is necessary to work together to ensure that identified goals will be completed within the estimated budget and schedule.
4. The Alviso and Lower Guadalupe Collaborative is not a legally binding document but it is signed in good faith.

The Collaborative meets monthly, on the second Tuesday of each month, unless a change in the meeting date is mutually agreed upon. All Collaborative meetings are open to the public.

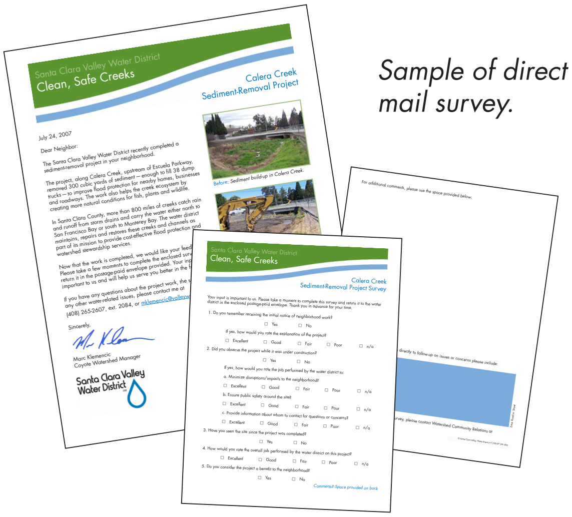
C8 Customer Satisfaction Index

The water district's first Customer Satisfaction Index was developed in fiscal year 2007. The first customers surveyed were those impacted by the water district's field work. The index is a compilation of results of surveys administered to the following customer groups in FY07:

- Field operations service requestors
- Permit applicants
- Field operations neighborhood project beneficiaries
- Capital project beneficiaries
- Treatment plant neighbors

The results to the right represent the **1,403** people who responded to a survey in FY07.

Each customer survey instrument was designed to elicit feedback on (1) communications, (2) responsiveness and (3) meeting customer requirements. Because the types of customers and projects vary, the survey questions in each category are modified for applicability. Thus, the numbers of responses indicated in the data chart vary.



Santa Clara Valley Water District
Clean, Safe Creeks

Calera Creek
Sediment-Removal Project

July 24, 2007

Dear Neighbor:

The Santa Clara Valley Water District recently completed a sediment-removal project in your neighborhood.

The project, along Calera Creek, upstream of Escuela Parkway, removed 300 cubic yards of sediment — enough to fill 38 dump trucks — to improve flood protection for nearby homes, businesses and roadways. The work also helps the creek ecosystem by creating more natural conditions for fish, plants and wildlife.

In Santa Clara County, more than 800 miles of creeks catch rain and runoff from storm drains and carry the water either north to San Francisco Bay or south to Monterey Bay. The water district maintains, repairs and restores these creeks and channels as part of its mission to provide cost-effective flood protection and watershed stewardship services.

Now that the work is completed, we would like your feed
Please take a few moments to complete the enclosed surv
return it in the postage-paid envelope provided. Your inp
important to us and will help us serve you better in the f

If you have any questions about the project work, the s
any other water-related issues, please contact me at
(408) 265-2607, ext. 2084, or mklemencic@valleyw

Sincerely,

Marc Klemencic
Coyote Watershed Manager

Santa Clara Valley Water District

Before: Sediment build-up in Calera Creek.

Santa Clara Valley Water District
Clean, Safe Creeks

Calera Creek
Sediment-Removal Project Survey

Your input is important to us. Please take a moment to complete this survey and return it to the water district in the enclosed postage-paid envelope. Thank you in advance for your time.

1. Do you remember receiving the initial notice of neighborhood work?
   ☐ Yes ☐ No
   If yes, how would you rate the explanation of the project?
   ☐ Excellent ☐ Good ☐ Fair ☐ Poor ☐ n/a
2. Did you observe the project while it was under construction?
   ☐ Yes ☐ No
   If yes, how would you rate the job performed by the water district to:
   a. Minimize disruptions/impacts to the neighborhood?
   ☐ Excellent ☐ Good ☐ Fair ☐ Poor ☐ n/a
   b. Ensure public safety around the site?
   ☐ Excellent ☐ Good ☐ Fair ☐ Poor ☐ n/a
   c. Provide information about whom to contact for questions or concerns?
   ☐ Excellent ☐ Good ☐ Fair ☐ Poor ☐ n/a
3. Have you seen the site since the project was completed?
   ☐ Yes ☐ No
4. How would you rate the overall job performed by the water district on this project?
   ☐ Excellent ☐ Good ☐ Fair ☐ Poor ☐ n/a
5. Do you consider the project a benefit to the neighborhood?
   ☐ Yes ☐ No

Comments? Space provided on back

For additional comments, please use the space provided below:

directly to follow-up on issues or concerns please include:

rvey, please contact Watershed Community Relations at

Sample of direct mail survey.

Some survey tools are newly developed while the surveys to Stream Maintenance Project beneficiaries were established in 2005.

Over time, the index can be used to show trends in customer satisfaction. Because we survey on the three specific factors, we do not have any comparator data from other agencies to benchmark against.

Nevertheless, we can be encouraged by the high percentage of responses that characterize the water district's performance as "good" or "excellent.

	Combined	
	# Responses	**% Good + Excellent**
Communication		**84%**
Impacts of activities	244	**82%**
Who to contact	579	**82%**
Keep neighbors informed; recall communication	1045	**79%**
Understand process	30	**77%**
Overall communication	837	**92%**
Average score		**84%**
Responsiveness		**85%**
Timely	170	**75%**
Courteous	156	**93%**
Resolution of issue or concern	75	**85%**
Ease in requesting service; contacting staff	90	**89%**
Average score		**85%**
Meeting Customer Requirements		**91%**
Minimize disruptions	1013	**90%**
Safety	950	**93%**
Appearance	339	**83%**
Project benefit	1258	**92%**
Overall performance	977	**90%**
Average score		**91%**
Combined index		**86**

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Santa Clara Valley Water District

D1 Principles of emergency management

Introduction to emergency management

The four phases of comprehensive emergency management (which is an all-hazards approach to the risks that each community faces) are: Mitigation, Preparedness, Response, and Recovery. In practice, each of the phases overlaps the other, creating a continuum of activity. At the same time, each of the phases has its own goals and serves as a building block for the next phase. Below is a brief description of each of these phases, most of which can be found in the handbook, "Emergency Management: Principles and Practice for Local Government," published in 1991 by the International City Management Association.

MITIGATION

The Federal Emergency Management Agency (FEMA) defines mitigation as, "acting before a disaster strikes to prevent permanently the occurrence of the disaster or to reduce the effects of the disaster when it occurs. It is also used effectively after a disaster to reduce the risk of a repeat disaster." Because it reduces risk, mitigation is as important as preparedness in providing effective local emergency management.

In California, the return on investment for mitigation activities is 1:3. That is, for every dollar spent on mitigation, we save three dollars in recovery costs. California's return on investment is lower than that for the nation as a whole, largely due to more stringent building and inspection codes. Across the United States, the return on investment is 1:4 and according to the World Bank, that number rises to 1:10 worldwide.

Guadalupe River underneath Highway 280.

Among other things, mitigation activities:

- Save lives and reduce injuries
- Prevent or reduce property damage
- Prevent or reduce damage to the environment
- Reduce economic losses
- Minimize social dislocation and stress, and protect mental health
- Protect infrastructure
- Allow critical facilities to function
- Lessen legal liability of government and public officials
- Provide positive political consequences for government action

Mitigation activities include:

- Land use planning to minimize hazardous areas (e.g., those prone to landslides, flooding, etc.)
- Strengthening building codes
- Reducing hazards by rezoning areas prone to repeated risk
- Sediment removal (Santa Clara Valley Water District)
- Catch basin cleaning (City of San José)

continued on back...

D1 Principles of emergency management

Preparedness

Preparedness is undertaken before a disaster, to build emergency management capacity. It focuses on the development of emergency operations plans and systems. Typical preparedness activities include:

- Development and maintenance of an Emergency Operations Plan
- Identification and training of staff to work in an Emergency Operations Center
- Citizen preparedness through training in a Community Emergency Response Team program
- Cultivation of relationships with key partners like the American Red Cross, utility companies, special districts, and others which share interests in the same community
- Individual creation of "go kits" for home, office, work, and school

Response

Response takes place immediately before, during, and directly after a disaster. The purpose of response is to minimize personal injury and property damage through emergency functions such as:

- Warning
- Evacuation
- Search and rescue
- Mass care and shelter
- Emergency repairs

Recovery

Recovery begins immediately following a disaster with efforts to restore minimum services to the stricken area and continues with longer-term efforts to return the community to normal.

Short-term recovery activities include:

- Damage assessment
- Debris removal
- Restoring utilities
- Restoring housing

Longer-term activities include:

- Rebuilding and redeveloping the community
- Implementing mitigation programs

D2 Local hazard mitigation plans

SUMMARY

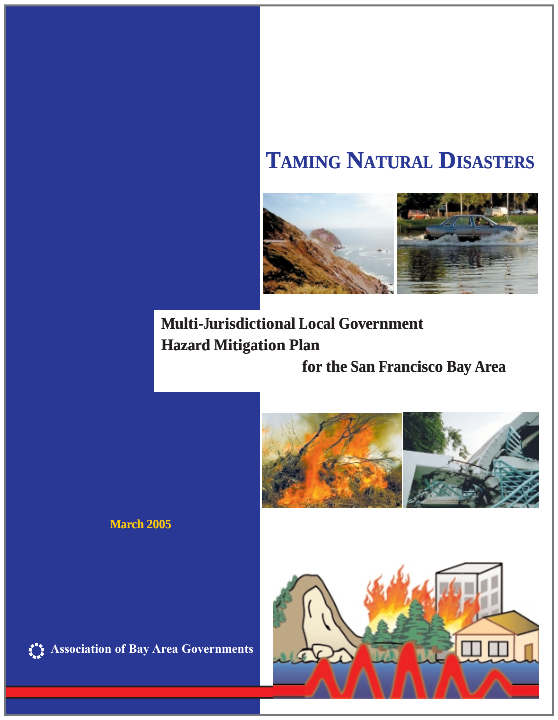
In April 2007, the Federal Emergency Management Agency (FEMA) approved local hazard mitigation plans for both the City of San José and the Santa Clara Valley Water District. With this approval, both jurisdictions are now eligible to compete for federal hazard mitigation grants.

BACKGROUND

The San Francisco Bay Area is subject to various earthquake-related hazards such as ground shaking, liquefaction, landslides, fault surface rupture, and tsunamis. The region is also subject to wildfires and weather-related hazards such as floods and landslides. Both the City of San José and the Santa Clara Valley Water District seek to maintain and enhance a disaster-resistant community by reducing the potential loss of life, property destruction, and environmental degradation from disasters, while accelerating economic recovery after a disaster.

Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to human life and property from hazards. The primary purpose of mitigation planning is to systematically identify policies, actions, and tools that can be used to implement those actions.

Public Law 106-390, known as the Disaster Mitigation Act of 2000 (DMA 2000), amended the Robert T. Stafford Disaster Relief and Emergency Services Act. DMA 2000 requires local governments to have a hazard mitigation plan, approved by the Federal Emergency Management Agency (FEMA), to be eligible to receive Hazard Mitigation Grant Program (HMGP) funds for disasters declared after November 1, 2004. Also affected are future mitigation project funding awarded through the Flood Mitigation Assistance program, the Pre-Disaster Mitigation grant programs, and the U.S. Small Business Administration low-interest, pre-disaster, small business loan program.


TAMING NATURAL DISASTERS

Multi-Jurisdictional Local Government
Hazard Mitigation Plan
for the San Francisco Bay Area

March 2005

Association of Bay Area Governments

In order to meet the requirements prescribed by DMA 2000, local governments must prepare a single jurisdiction plan or participate in the development of a multi-jurisdictional plan.

- The Association of Bay Area Governments (ABAG) developed a multi-jurisdictional plan entitled, “Taming Natural Disasters.” FEMA previously approved ABAG’s plan as a local hazard mitigation plan for the San Francisco Bay Area.
- To create their mitigation plans, both the City of San José and the Santa Clara Valley Water District chose to adopt ABAG’s plan. In order to meet specific needs, each jurisdiction attached separate annexes to the ABAG plan that outline strategies and commitments for each jurisdiction.
- To date, more than 60 local jurisdictions are participating in ABAG’s plan.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

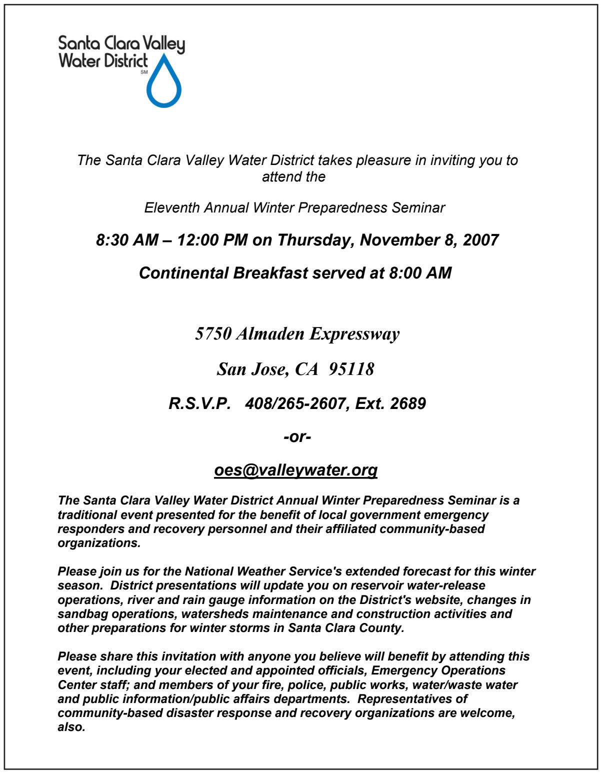
Santa Clara Valley Water District

D3 Flood hazard information and activities

Winter Preparedness Seminar in November

On the third Thursday of every November, the water district hosts a winter preparedness seminar for county emergency managers and first-responders. Now in its 11th year, the annual meeting allows county, city and district personnel to share information and exchange contact information in advance of the rainy season. Information provided by the water district typically includes reservoir operations, rain gauge and ALERT system capabilities, community outreach efforts, website emergency page information, sandbag availability, and watershed field staff presentations on pre-rain season stream maintenance and status of capital flood-protection projects. In addition, National Weather Service representatives offer tentative long-range forecasts for Santa Clara Valley. The seminars also review use of policy and procedures such as emergency pump shut-off plans, and city and district resources.

The seminars have proven vital for interagency planning and integrated response to winter storm events.



Santa Clara Valley Water District

The Santa Clara Valley Water District takes pleasure in inviting you to attend the

Eleventh Annual Winter Preparedness Seminar

8:30 AM – 12:00 PM on Thursday, November 8, 2007

Continental Breakfast served at 8:00 AM

5750 Almaden Expressway

San Jose, CA 95118

R.S.V.P. 408/265-2607, Ext. 2689

-or-

oes@valleywater.org

The Santa Clara Valley Water District Annual Winter Preparedness Seminar is a traditional event presented for the benefit of local government emergency responders and recovery personnel and their affiliated community-based organizations.

Please join us for the National Weather Service's extended forecast for this winter season. District presentations will update you on reservoir water-release operations, river and rain gauge information on the District's website, changes in sandbag operations, watersheds maintenance and construction activities and other preparations for winter storms in Santa Clara County.

Please share this invitation with anyone you believe will benefit by attending this event, including your elected and appointed officials, Emergency Operations Center staff; and members of your fire, police, public works, water/waste water and public information/public affairs departments. Representatives of community-based disaster response and recovery organizations are welcome, also.

Invitation to annual winter preparedness seminar

Santa Clara County Emergency Preparedness Council (EPC)

On Oct. 18, 1983, the Santa Clara County Board of Supervisors created the Emergency Preparedness Council (EPC), replacing the Operations Area Coordinating Council. EPC voting members include a county supervisor, and an elected councilperson or mayor from each of the county's 15 cities. The county executive (or his/her designee) and the county coordinator of emergency services are designated as non-voting members.

The purpose of the EPC is to:

- Educate elected officials about their duties and responsibilities to mitigate disasters,
- Encourage coordinated emergency planning between and among cities and the county,
- Support local, state and federal legislation favorable to disaster planning, mitigation and recovery, and
- Promote individual, family and neighborhood post-disaster self-reliance programs.

In 1997, the EPC charter was amended to designate the EPC:

- as Santa Clara County Operations Area Council (OAC) with governing body authority to carry out responsibilities required by the California Governor's Office of Emergency Services.

In 2006, the EPC voted to add the water district as a member.

On Feb. 27, 2007, upon recommendation of the EPC, the Board of Supervisors expanded membership to include a water district board member. Director Richard P. Santos currently represents the water district.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Santa Clara Valley Water District

D4 Emergency Operations Center (EOC) activation

City of San José Emergency Operations Center activation floodwatch and response

A. Response objective

Provide timely flood observations and recommendations to the Office of Emergency Services and the City Manager's Office during a potential flood event.

B. Special preparation activities

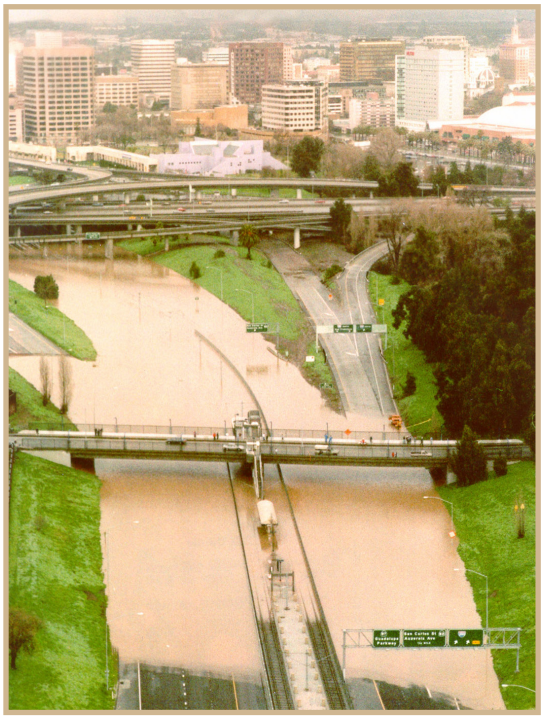
Every year before the rainy season, the Department of Public Works and the Department of Transportation (DOT) implement a training event to prepare staff and review additional resources available at each Department Operations Center (DOC). The Departments establish and maintain a 24-hour, three shift "Recall List" of qualified staff to monitor the weather, river and stream levels and the conditions of the City's storm drainage systems, to prepare for activation of Department(s) DOC's or the City EOC, in the event the EOC is activated prior to the Department DOC's. Additional staff are also dispatched to the water district's EOC in the event of activation.

C. Steps for activating floodwatch

1. Monitor Weather: The E&CS Division Manager and the Storm Engineering Program Manager (Public Works) monitor weather and maintain contact with the water district and with Department of Transportation Storm Maintenance staff.

2. Advise Director and OES: The E&CS Division Manager or the assigned Deputy Director will keep the Directors of Public Works and DOT apprised of weather conditions and forecasts. The information is also forwarded to the Office of Emergency Services (OES) and the City Manager's Office.

3. Recommend Activation of EP&R Plan: The E&CS Division Manager, or Deputy Director will recommend activation of the Emergency Preparation and Response Plan and recall of DOC Team personnel designated for Flood Watch.



Flooding from the Upper Guadalupe River caused the closing of Highway 87 near Downtown San Jose in 1995.

4. Set Up Department Operations Centers: The assigned Deputy Directors will authorize the E&CS Division Manager and the DOT Storm Maintenance staff to set up the DOC's for Floodwatch and to recall the preassigned staff responsible for the appropriate shifts.

5. Recommend Activation of EOC: The assigned PW Deputy Director, based on information from the DOC Leader or Division Manager, recommends activation of the EOC to the City Manager's Office. During EOC activations, staff from Public Works and DOT are assigned shifts in the water district EOC to ensure constant communication between agencies.

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D4 Emergency Operations Center (EOC) activation

Santa Clara Valley Water District's Emergency Operations Center (EOC) activation

Response objective

Mission: Expedite abnormal situation assessment and recommend to the EOC Director (General Manager or designee) any action(s) necessary to respond to and/or mitigate consequences of emergency conditions.

Preparation activities

The Office of Emergency Services (OES) operates a comprehensive program that includes multi-hazard emergency response planning, training and exercise, and operation and maintenance of the water district's Emergency Operations Center. Every year OES facilitates tabletop exercises district-wide as well as specific trainings with the Watershed Operations Divisions to prepare for flood events. OES prepares and maintains an Emergency Operations Center staff directory, following the Standardized Emergency Management System/National Incident Management System (SEMS/NIMS) format. Directory staff is required to carry pagers and OES staff conducts monthly pager tests to ensure communications are properly functioning and maintained.

Steps for activating the EOC

During flood events: The Watershed Field Operations maintains an on-call staff person that also acts as an Incident Commander when called out in the field during flood events. Watershed Field Operations maintains a Departmental Emergency Operations Center (DEOC). There are two triggers to activate the DEOC:

1. Water district EOC is opened for a Watershed Operations related activity (a page alert is sent out by the water district's Office of Emergency Services on the EOC Emergency Pager in this case), or

2. The Field Operations on-call staff responds to a page and determines that the event has escalated to a situation or incident. At this point, they will contact the DEOC Manager. DEOC Manager decides either individually or through consultation with on-call staff, EOC Manager, District Office of Emergency Services, or Assistant General Manager of Watersheds whether to activate.

- Event – Minor interruption of normal business operations requiring a response from a single maintenance crew or unit. DEOC activation is not required, but may be activated for training purposes. Management staff monitors situations.
- Situation – Moderate interruption of normal business operations requiring intervention by two or more maintenance crews or units working together. Notifications per the procedure must be made and DEOC activation is recommended, but not required. Management staff monitors operations, through field staff.
- Incident – Moderate to severe disruptive impact (or threat of) on affected unit's ability to contribute to normal water district mission or normal unit activities or a situation that requires multiple divisions to respond. Formal activation of the DEOC and notifications are required.

The water district's EOC may be requested to open from the DEOC manager. The water district's EOC uses three levels with a multi-hazard approach to activation.

Level 1 - EOC manager/director convenes a situation-specific SEMS/NIMS team meeting to quickly assess impact, may lead to physically activating to fulfill action planning.

Level 2 - EOC activates operations on a short–term basis.

Level 3 - EOC activation consists of rotating shifts in all SEMS/NIMS EOC sections.

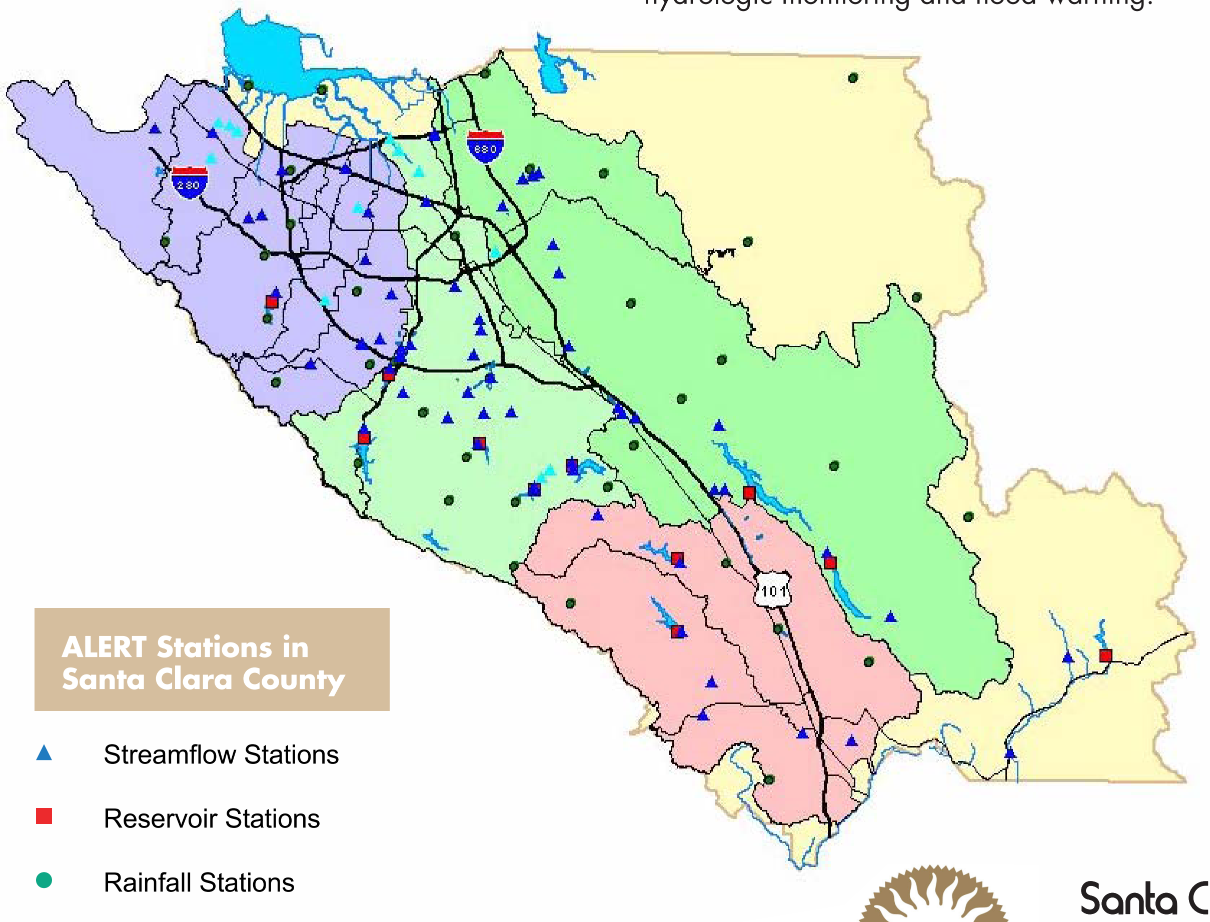
D5 Automated Local Evaluation in Real Time (ALERT)

ALERT is a cooperative program initiated by the National Weather Service's California-Nevada River Forecast Center in the 1970s. In this program, a local agency installs, maintains, and monitors event reporting field sensors that report current hydrologic conditions in real time through radio telemetry.

The Santa Clara Valley Water District began installation of its ALERT system in 1983. As of September 2007, the system includes 39 rain gauges, 23 streamflow gauges, 10 reservoir gauges, and one weather station. The real time data collected are used internally at the water district to monitor hydrologic conditions in support of maintenance and operations functions, as well as to make flow projections on some of the larger watersheds.

For flow forecast purposes, data are taken from the ALERT system and used for input into hydrologic models. These models are then used to forecast a range of possible peak reservoir and stream levels. The ALERT network has preset alarm levels for rainfall intensities and water surface elevations which, when activated, will advise Hydrologic Data Management Program (HDM) on-call personnel to verify conditions and notify water district personnel and specified local agencies when necessary. HDM supports 47 separate pages on the water district's website.

The water district participates in the hydrologic monitoring and flood warning community through the ALERT Users Group and the National Hydrologic Warning Council (NHWC). This allows water district staff to maintain associations with government agencies, private sector vendors, and consultants involved with the business of hydrologic monitoring and flood warning.



ALERT Stations in Santa Clara County

CITY OF
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Santa Clara Valley Water District